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2

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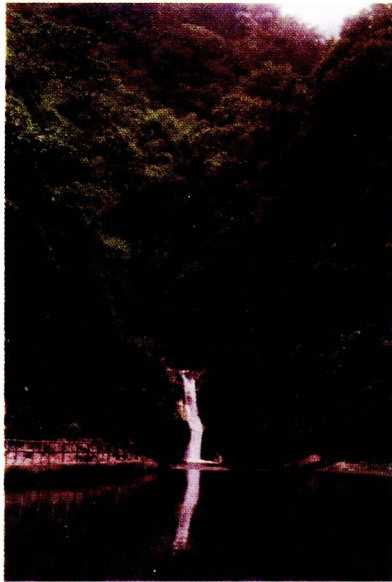
Nos.3&4



Spotted Owlet

Photo By Bhagat Singh

*Published with partial financial assistance of
Uttarakhand State Council for Science & Technology (UCOST)*



"Forest is the mother of River"
A Catchment area in Darjaling

Photo - A.S. Negi



A Eco-Tourism spot in Darjaling

Photo - A.S. Negi

Editorial

Wildlife Preservation Society of India, Dehradun was founded on 13th April 1958. The first issue of Cheetal, a cyclostyled and bound magazine was manually distributed to its members in 1959 and the first General Body meeting of Wildlife Preservation Society of India was held on 19th April 1959. The society has completed 50 years of its formation and has seen its glorious past with very eminent conservationists on the list of its members. The president of the Society H.H. Maharaja of Nabha in his address during first General Body Meeting had stressed the need of spreading the message of urgency of conserving our wildlife for the posterity. Fifty years down the line many species of flora and fauna are facing extinction, large chunks of forests have been lost to the so called development activities, there have been large scale fragmentation of our compact forests and most of our forests have degraded to a alarming extent. The political concern to conserve our forests and wildlife is becoming less and less both at the States as well as Central Government levels. State Governments are bent upon sacrificing their forests for development activities without following the principle of sustainable development. The onus of conservation has shifted from political and administrative hands to the higher judiciary. The political interests mainly of vote catching are weighing heavily against the social and national interests causing large scale deforestation in bits and pieces without any comensurate effort to make up the loss by rehabilitating the degraded forests or reclaiming waste lands. A time has come when all the concerned citizens have to join hands to reduce the loss of biodiversity which in the long run can be a cause for the inhilation of humans itself. Let us give a serious thought as to how we can be of some help individually and collectively.

A.S.Negi

August 2008.

Letters to The Editor

Respected Sir,

I would like to thank you for the lovely time I had at the "Nature Treck" conducted by the W.P.S.I.

I had been to Chakrata many times before but had never gone into the details of the flora of the place as I did this time. You tirelessly explained each and every tree and plant in the area to all of us and made the "Treck" a learning as well as truly enjoyable experience.

I came back with some beautiful photographs and some new friends.

Thank you once again.

With Best Wishes,

Yours,

Dr. Parshant Singh

Prashant Singh <neerpar @ Yahoo.Co.in

Dear Sir,

The act of a Bishnoi women in Bawarla Village of feeding her on milk to a (motherless) baby deer is humane and exemplary. (Chetal Vol. 46 No. 1 to 2) the article mentions a few tenets out of 29 they follow. I shall be glad to know all those 29 tenets

DIGAMBAR GADGIL

39, Anandvan Colony,

College Road, Nashik-422005.

Dear Mr. Negi

Aadab,

Let me send my sincere thanks for the wonderful journal of wild life Perseveration Society of India, CHEETAL Vol 46 March 2008. Front cover page picture is very captivating and definitely encourage the Wild life conservation – specially the Cat Family seems on the way of extinction.

It was more than thoughtful of you to send this nice journal.

My best Wishes,

Yours sincerely,

Dr. S. Farooq

321-D Okhla Village, New Delhi

Cover Page

Spotted Owlet (*Athene brama*)

- Family** : STRIGIDAE
- Range** : Throughout the country upto 1800 m in the Himalayas
- Habitat** : Open forests, orchards, cultivation, vicinity of habitation
- Food** : Insects, small rodents, lizards and birds
- Voice** : Assortment of scolding and cackling notes, screeches and chuckles.

Description : Size about 20 cm. No ear tufts, sexes alike, grayish brown plumage, spotted white, yellowish eyes, broken whitish buff nuchal collar.

Young birds more thickly marked white, darkish streaks below breast. Live in pairs or small parties, roosts during day in leafy branches, tree cavities or cavities in wall.

Nesting Season: Principally Nov to April, Eggs 3 or 4 laid on untidy pad of tow or fibre in tree hollows, holes in crumbling walls. Both sexes share all the domestic duties.

Important Notice to Readers

The first nature trek sponsored by Uttarakhand Council of Science and Technology (UCOST) has successfully been completed but the participation from our members was poor.

The next trek is proposed to Dodital in Uttarkashi, a 22 km. long trek through amazingly beautiful and virgin forest, to be done in 3 days (In all). Dodital is a natural lake in the midst of fir spruce forests. It has rainbow trout introduced some 100 years back. Nominations/suggestions are invited at priyanka_negi@rediffmail.com or write to A.S. Negi, Executive Vice President, 300 Model Colony, Araghar Dehradun (Mobile No. 9837015819) by 31st August 2008.

A.S. Negi

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A.S. Negi

Ice Fish - The Survival Secret and Possible Implications

*Surabhi Bajpai and P.K. Bajpai

The ice fish are a noted group of teleosts that do not freeze even at sub zero temperatures. But they are not the only group to do so, besides them certain insects, plants, fungi and bacteria survive such low temperatures as all of them possess antifreeze or "ice structuring" proteins. Most of the ice fish inhabit marine waters between -2° to 4° C. The waters of Southern ocean are much colder where fish or animals of temperate or tropical zones would freeze. The salt present in the sea water further contributes to the lowering of the freezing point to about -1.9° C i.e. around two degrees below that of fresh water, while the specific proteins along with the body salts bring that of the blood and the body fluids of the ice fish -2.5° C. Some species of the ice fish inhabit waters around New Zealand and South America where the temperature is about 10° C.

Classification and Some Biological Peculiarities

The ice fish belong to the suborder Notothenioidei of Order Perciformes of Class Actinopterygii. There are 8 families, 44 genera and around 130-131 species in this order of ice fishes, out of which 28-29 species are non-Antarctic while rest are from Antarctica, a comparatively better explored habitat. However, the new species are yet being reported. Following is the list of the families and known genera of ice fish given by Eastman and Eakin (2000) -

1. Family Bovichtidae
Genus Bovichtus (9 species, 8 non-Antarctic)
Genus Cottoperca (1 species, non-Antarctic)
2. Family Pseudaphritidae
Genus Pseudaphritis (1 species, non-Antarctic)
3. Family Eleginopidae
Genus Eleginops (1 species, non-Antarctic)
4. Family Nototheniidae
Genus Aethotaxis (1 species)
Genus Cryothernia (2 species)
Genus Dissostichus (2 species)
Genus Gobionotothen (4 species)
Genus Gvozdarus (1 species)
Genus Lepidonotothen (6 species, 1 non-Antarctic)
Genus Notothenia (5-7 species, 2-3 non-Antarctic)

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- Genus Pagothenia (2 species)
- Genus Paranotothenia (2 species)
- Genus Patagonotothen (14 species, all non-Antarctic)
- Genus Pleuragramma (1 species)
- Genus Trematomus (11 species)

5. Family Harpagiferidae

- Genus Harpagifer (6 species)

6. Family Artedidraconidae

- Genus Artedidraco (6 species)
- Genus Dollodidraco (1 species)
- Genus Hitiidraco (1 species)
- Genus Pogonophryne (22 species)

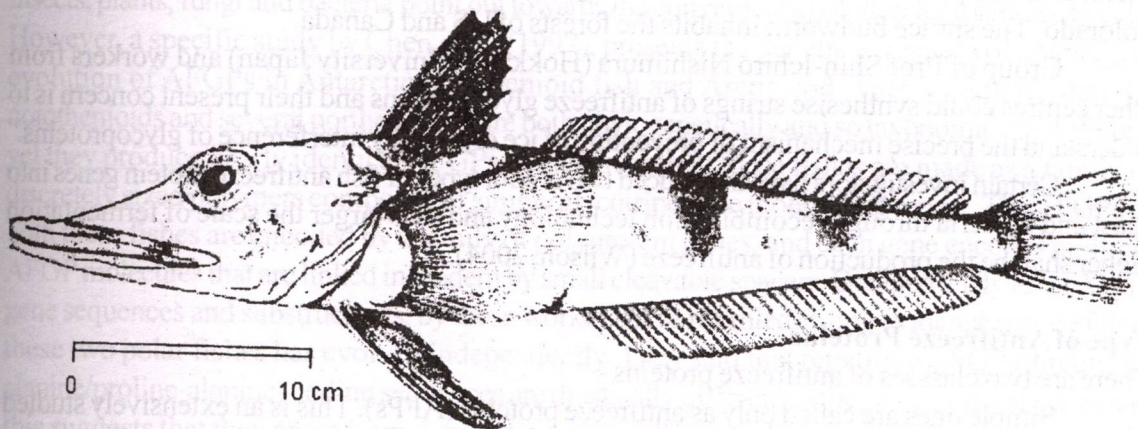
7. Family Bathydraconidae

- Genus Acanthodraco (1 species)
- Genus Akarotaxis (1 species)
- Genus Bathydraco (5 species)
- Genus Cygnodraco (1 species)
- Genus Gerlachea (1 species)
- Genus Gymnodraco (1 species)
- Genus Parachaenichthys (2 species)
- Genus Prionodraco (1 species)
- Genus Psilodraco (1 species)
- Genus Racovitzia (1 species)
- Genus Vomeridens (1 species)

8. Family Channichthyidae

- Genus Chaenocephalus (1 species)
- Genus Chaenodraco (1 species)
- Genus Champscephalus (2 species)
- Genus Channichthys (1 species)
- Genus Chionobathyscus (1 species)
- Genus Chionodraco (3 species)
- Genus Cryodraco (1 species)
- Genus Dacodraco (1 species)
- Genus Neopagetopsis (1 species)
- Genus Pagetopsis (2 species)
- Genus Pseudochaenichthys (1 species)

Genus Brulenthius (1 species)



Chaenocephalus aceratus

However, all Antarctic species do not possess antifreeze protein, specially those from sub-polar areas. The young or larval stages of certain species have very low anti-freeze concentration. The animals in general have one or the other respiratory pigment for oxygen transportation, and most of vertebrates have haemoglobin for that but the members of family Channichthyidae lack haemoglobin and thus may be called as bloodless fish. These fish survive for two reasons - 1. The oxygen contents are high in cold waters of Southern ocean and 2. The oxygen is absorbed, transported and distributed directly by plasma.

The members of suborder Notothenioidei do not have swim-bladder and hence their buoyancy is very limited. Consequently they are basically benthic or demersal but yet some species have acquired relatively increased buoyancy partly for increased lipid deposits in their tissues and partly for less ossified endoskeleton.

History and Recent studies on Biological Antifreeze Compounds

The antifreeze proteins were first discovered by Dr. Art De Vries in early 1960s, from the fish that he collected at McMurdo Station as graduate student of Stanford University. An article in March 19, 2000 issue of *Science Daily* reports that "ice structuring" proteins occurring in fish, insects, plants, fungi and bacteria attach to the surface of ice crystals and so inhibit the growth of ice and protect the organism from freezing death. However, some ice structuring proteins, like those of spruce bud-worm are more active and effective than those of fish.

Fluorescent microscopy using a fluorescent dye labelled ice structuring protein, revealed the way the ice formation is inhibited in spruce bud worm. This study was carried out by Ido Braslavsky (Assistant Professor of Physics and Astronomy, Ohio University), Prof. Peter Davies

(Biochemistry and Biology, Queen's University, Canada) and Natalya Pertaya, a post doctoral fellow and was presented at the March meeting of American Physical Society, held at Delver, Colorado. The spruce budworm inhabits the forests of US and Canada.

Group of Prof Shin-Ichiro Nishimura (Hokkaido University Japan) and workers from other centres could synthesise strings of antifreeze glycoproteins and their present concern is to understand the precise mechanism of prevention of ice crystals by interference of glycoproteins.

Certain investigators have introduced two or four types of fish antifreeze protein genes into yeast and bacteria through recombination technology and thus larger the scale of fermentation higher shall be the production of antifreeze (Wilson, 2004).

Type of Antifreeze Proteins

There are two classes of antifreeze proteins -

1. Simple ones are called only as antifreeze proteins (AFPs). This is an extensively studied group of AFPs and the mechanism of ice crystal inhibition is known in this case. These proteins have been produced by solid phase synthesis and also by gene expression method.
2. Antifreeze glycoproteins (AFGPs) consist of repeating units of a tripeptide composed of alanine-threonine-alanine. Thus these are composed of only two amino acids. The NMR spectroscopy and the computational modeling by Nishimura group have helped working out the 3-D structure of AFGPs. It is a left handed helix and the threonyl residue is with a disaccharide attached to it. All residues face one side and form a hydrophilic front while the amino acid (hydrophobic peptide) back-bone and the methyl groups form the other side of this protein. There are innumerable combinations and numbers of these glycoprotein units in the blood of ice fish and that makes it difficult to isolate and purify them.

The AFP and AFGP Prevent the growth of Initial Ice Crystals

It is not that no ice is formed at all in the body fluids of ice fish. The AFPs along with other body salts, as said earlier, lower the freezing point of the body fluids to -2.5°C , which is a little below the freezing point of sea water. The AFPs bind to the tiny ice crystals, that are formed in the body fluids and thus inhibit their growth to prevent the freezing of whole fluid mass. It involves adsorption-inhibition process. Though the exact mechanism is yet to be understood, but it is apparent that ice fish survive with very small ice crystals in their body fluids.

The group of Prof. Nishimura have tested the antifreeze properties of different sizes of synthesized strings of AFGPs so as to understand the antifreeze efficiency of different sizes of simple or repeated units. The group reported that a single AFGP unit forces the ice crystal into hexagonal pyramids. A molecule of two sub units that may be called as a dimer already shows antifreeze properties. An AFGP molecule may have a maximum of 5 units. An increase from 2-5 units shows a proportional rise in the antifreeze properties.

It can be said in nut shell that AF molecules plug the gaps in the tiny ice crystals and thus prevent the attachment of more ice molecules and effectively stop the ice growth.

The Convergent Evolution

As said earlier the occurrence of antifreeze in Antarctic ice-fish, some arctic fish, certain insects, plants, fungi and bacteria point out towards the convergent evolution for tolerance to cold. However, a specific study by Chen *et al.* (1997), presents the genetic evidences of convergent evolution of AFGPs in Antarctic notothenioid fish and Arctic cod. They said that Antarctic notothenioids and several northern cods are both phylogenetically and so taxonomically different, yet they produce nearly identical AFGPs, which in both of these fishes are made as a family of discretely sized polymers composed of simple glycotripeptide monomeric repeat. The AFGPs of both these fishes are encoded by a family of polyprotein genes, and each gene encodes multiple AFGP molecules that are linked in tandem by small cleavable spacers. Detailed analyses of AFGP gene sequences and substructures, by these workers have revealed strong evidence that AFGP in these two polar fishes has evolved independently. They said that repetitive AFGP (threonine-alanine/proline-alanine) coding sequences are drastically different in the two groups of genes and this suggests that they arose from duplication of two distinct, short ancestral sequences with a different combination of codons for the same tripeptide. The molecular evidence for separate ancestry is further supported by the taxonomic, morphological, palaeontological and palaeoclimatic evidences, which collectively indicate that the said polar fish evolved their concerned AFGPs separately and finally achieved same AFGPs through convergent evolution and this is obvious for the presence of AF compounds in other organisms as well.

Prospective Industrial and Biological Implications of AFPs/AFGPs

There are probabilities of several different applications of AFPs/AFGPs. This is further notable that these natural antifreeze compounds are about 300 times more effective than the conventional antifreeze compounds at the same concentration and are also non polluting. (Wilson, 2004). The following expected fields are there for applying AFP/AFGPs, depending on the advancement of concerned techniques.

1. It is important as AFGPs do not evoke as much immune response as AFPs do, and hence AFGPs have better prospects of their medical applications.
2. Prevention of freezing of food and injuries as cryopreserved items are sometimes inedible due to ice caused damage ; according to *Science Daily* (March 19, 2007) the AFP/AFGPs inhibit ice formation in ice-cream and is being so used by at least one commercial food manufacturer.
3. Cryopreservation of organs and tissue without the consequent cryoinjuries by the current methods and so these proteins seem to be much potent cryoprotectants.
4. Cold and frost resistant plants can also be genetically engineered.
5. A precise understanding of the *modus operandi* of these proteins may help to understand the growth processes of the pathogenic biocrystals such as those causing gout, kidney and gall bladder stones for example and possibly shall help to design prevention methods as well.

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Dalma- the threatened paradise of Elephants

* Urmila Gupta

INTRODUCTION

The Dalma Wildlife sanctuary is located between 22° 5' 30" and 22° 57' North latitude and 86° 7' and 86° 20' East longitude and it covers an area of 193.22 km², in the Dalma hill range of Singhbhum district of Jharkhand, whereas the extent of Dalma hill range itself is 1843 Sq Km. the nearest town to this sanctuary is Steel city of Jharkhand, Jamshedpur. It was declared as sanctuary by the Government of Bihar, under the Wildlife Protection Act. 1972 in 1976. The area of the sanctuary forms the part of catchment area of Suwarnarekha River. The Sanctuary is surrounded by hills like Dalma, Bhilai pahari, Dalapani, Amda hills and others, among which Dalma hill (926 m) is the highest. The Chandil town, road NH32, Sini- Asansol section of South-Eastern railway forms the western bounary; the road NH33, Subarnarekha river and Jamshedpur town forms southern boundary and Purulia dist. lies in the east: Whereas Patamda block of east Singhbhum District forms the western boundary of the sanctuary.

Description of the Sanctuary

Dimna lake is adjacent to this sanctuary through which water is supplied to Jamshedpur town. Run of from the hill slopes of the dalma, adds to the water of Dimna Lake, but the lake is not a part of the sanctuary. Climatic conditions are hot and humid, whereas the temperature during the summers varies from 22°c-38° c and 50-28° c during the winters. Annual rainfall during rainy season in 1554 mm. The average number of rainy days is 60.7. The rainy season starts from the middle of June. The temperature remains cool and pleasant even in May and June, on Dalma hilltop. The occasional showers in afternoon are not unexpected in these hills in summer, but the general climate is hot.

The sanctuary is covered with predominantly sal forests (*Shorea robusta*). As per the Champion and Seth's classification, the forest type of the area is North tropical high deciduous (5b/ cic & peninsular Sal Forests (5B/C2). The principal Wild life inhabiting the areas are the Elephant (*Elephas maximus*), leopard (*panthera Pardus*), tiger (*Panthera tigris*), sloth bear (*Melursus ursinus*), Wild boar (*Sus scrofa*), giant squirrel (*ratufa indica*), langur (*Presbytis entellus*), barking deer (*Muntiacus muntjak*), Cheetal (*Axis axis*) mouse deer (*Tragululus meminna*), wild dog (*cuon alpinus*), ratel (*Mellivora capensis*), hyena (*Hyaena hyaena*), Indian fox (*Vulpes bengalensis*), Indian wolf (*Canis lupus*), python (*Python spp.*), civet (*Viverroc spp.*) fishing cat (*Felis viverrina*), Indian hare (*Leps nigricollis*) etc. and the major birds species are peacock (*Pavo cristatus*), red jungle fowl (*Gallus gallus*), grey hornbills (*Tockus birostris*) etc. Except for passing reference about the forests of sanctuary in early records, very little is known about the wild life of the area. Wildlife census, of 1977-1995 reports the occurrence of 22 male, 33 female & 18 sub adult elephants, in the sanctuary. As per the bio-geographical classification of India by Rodgers and Panwar (1988), the Dalma sanctuary is situated in Indomalayan area of Deccan plateau of Chotanagpur region (6B). Most

important species of the sanctuary is the Asian elephant (*Elephas maximus*). This area is best suited habitat for the elephants, as enough water is available throughout the year. one can find as many as 45-85 elephants during the summer. The migration of elephants occurs to and fro, from Bihar, west Bengal and Orissa, according to the season. The elephant of various age groups can be seen in this area, all the year around. Fortunately, the problem of poaching for tusks (for its ivory) is not present and large number of tuskers can be sighted in the sanctuary. in fact, the locals have religious sentiments towards this animal. Incidentally, the sanctuary also comes under the "Singhbhum project Elephant" range also.

Besides the major animals and birds, many migratory birds also visit the Dalma canal and Chandil lake surrounding the sanctuary during the winters. Unfortunately the complete inventory of all the animals, birds and particularly insects and reptiles has not been prepared.

The administration and management of this sanctuary is done by Ranchi Wild life Division of State Forest Department, which carries out regular Wild life census. The result of one such census is shown in the Table-1 below.

Table-1 WILDLIFE CENSUS, FIGURES OF OTHER ANIMALS (1977-1995)

S.No	Fuana	1977	1982	1987	1990	1991	1992	1993	1994	1995
1	<i>Melursus ursinus</i> (Sloth Bear)	12	64	65	41	15	28	32	19	19
2	<i>Sus scrofa</i> (Wild Baor)	57	50	35	59	70	63	88	54	62
3	<i>Tragulus meminna</i> (Mouse Deer)	0	2	2	2	2	3	2	4	5
4	<i>Presbytis entellus</i> (Langur)	83	23	41	2	11	17	18	8	14
5	<i>Macaca mulatta</i> (Monkey)	1	240	237	200	172	217	288	255	348
6	<i>Counalpinus</i> (Wild Dog)	0	11	3	2	8	2	2	0	2
7	<i>Panthera pardus</i> (Leopard)	0	2	0	1	1	0	0	1	1

8	Mellivora capensis (Ratel)	0	0	1	0	1	1	1	0	0
9	Ratufa indica (Indian giant squirrel)	0	6	22	43	37	41	44	45	44
10	Pavo cristatus (Peafowl)	12	98	32	56	35	38	44	47	36
11	Hyaena hyaena (Hyena)	0	0	3	10	12	8	12	10	0
12	Herpestes Spp. (Mongoose)	0	0	17	9	20	17	15	23	27
13	Vulpes bucopus (Indian fox)	1	2	0	0	0	0	0	0	0
14	Canis lupus (Indian wolf)	0	0	2	10	0	1	2	4	16
15	Python spp (Python)	0	0	4	6	7	12	12	2	2
16	Viverroac spp. (Civet)	0	0	5	9	0	2	0	0	0
17	Panthera tigris (Tiger)	0	0	0	1	1	0	0	0	0
18	felis veerrina (Fishing Cat)	0	0	0	2	0	0	0	0	0
19	Muntacus muntjak (Barking deer)	7	27	21	11	14	19	21	19	16
20	Tockus birostrics	0	0	0	2	0	4	8	0	1

21	Gallus gallus (Redjungle Fowl)	0	0	0	0	0	0	0	14	134
22	lepus nigricollis (Indian Hare)	0	0	0	0	0	0	0	1	0

Elephants of Dalma Wildlife Sanctuary live in highly fragmented groups varying from 2-14. Prater had observed that elephants live in herds of 5 to 60 or more. The herds are believed to be composed of single families which break up into small groups when there is scarcity of food.

Unless corridors to the Dalma hills are managed effectively, the Elephants of this sanctuary are destined to get wiped out due to conflict with humans. Although Dalma is a declared Sanctuary and protected by Wildlife (Protection) Act, 1972, the rightful denizens of this Forest are subjected to much competition for food with growing domestic cattle and human interference.

Table 2

Human Interference in the Dalma Wildlife Sanctuary Distt. Singhbhum, Jharkhand.	
The following statistics indicates the level of biotic interference present in the sanctuary	
No. of villages nearby	:132
No. of villages with in Dalma sanctuary	: 85
Total population within Dalma sanctuary	: 32, 180
Cattle population depending on the forest (for regular grazing)	: 41,050
Wildlife casualties during 1996 Sendra	
Animal	Numbers killed
Sloth bear	1
wild boar	4
Barking deer	5
Snake	1
Monkey	1
Porcupine	1
Peafowl	1
Red jungle fowl	2
Indian hare	3
Palm squirrel	5
Total	24

THE THREATS

85 villages which are located in and around the sanctuary, are mainly dependent on it for the grazing purposes. many people visit the sanctuary daily to collect the head load of fire wood in order to eke out a living by selling them in the near by Maango and other small markets. Annual hunting festival locally known as SENDRA also takes place in April or May during which various animals are hunted by the villagers coming from far off places as far as Purulia Distt (West Bengal) and Mayurbhanj distt.(Orissa). Sendra is considered as religious and historic festival by the tribes (Santhal, Pahaia, Kharia, Bhumij and Mahto etc.) causing great turmoil and disturbance to fauna of the sanctuary during this period. As would appear from the foregoing discussion, the Dalma sanctuary is subjected to tremendous human interference in addition to occasional poaching.

Due to human population growth, interference with the freedom of wildlife of the area is increasing in the form of encroachment, deforestation, livestock grazing, poaching, fire hazards and developmental activities. In addition to the above reasons, the corridor facilitating free movement of elephants from the Ayodhya hills to Dalma and vice-versa is likely to be cut off due to deforestation and human settlement leaving the elephants of Dalma isolated.

During one of the Sendra in the year 1996, the number of wild animals killed are shown in Table-2. There are chances that the casualty figures were much more but could not be detected. Hence 'Sendra', the annual ritual of tribal hunt is proving a very disturbing event every year for the wild life. Yet it can not be simply wished away by the sanctuary authorities or anyone concerned for the welfare of "Dalma".

SUGGESTIONS

The "SENDRA" ritual is to be seen as a religious - cultural tradition of local tribals and not simply a case of "mass poaching". If the sanctuary authorities are able to appreciate the viewpoint of tribals; certainly some alternative can evolve with the active involvement of tribal groups. Any such joint effort involving the Forest Department; community and genuinely concerned NGO will certainly help in evolving less damaging ritual during "Sendra".

The figure in Table-1, indicate that the large predators are almost absent, though the major one like tiger (*panthera tigris*) and leopard (*panthera pardus*) have been occasionally seen by them. Other common ungulates like Chital (*Axis axis*) and Sambhar (*Axis spp.*) are conspicuous by their absence.

The Table -3, shows the trend in elephant population in the sanctuary starting from 1977.

Table -3 Elephant census in dalma sanctuary 1977-1995

Fauna	1997	1982	1987	1990	1991	1992	1993	1994	1995
Elephant (<i>Elephas maximus</i>)									
Male	25	17	23	25	23	25	24	23	22
Female	32	23	34	32	40	31	26	31	33
Sub adult	05	09	19	11	13	12	11	16	18
Total	62	49	76	68	76	68	61	70	73

Following steps are important for land use planning in Dalma sanctuary for healthy level of population

1. A forest corridor should be maintained connecting dalma sanctuary and Ayothya hills of West Bengal and forest of Porahat and Saranda.
2. The entry and movement of villagers of surrounding area for grazing their cattle and collection of firewood etc. should be restricted by adopting Eco-Development activities.
3. To directly confront this issue or to spread the message of wildlife conservation, documentation like leaflets, booklets, talks on Radio, T.V. are needed. local N.G.O. can also be involved to spread the message as mass awareness campaign.
4. Efforts can be made for diverting the sentiment of the people, who gather for Sendra, by organizing a community fair. Also by restricting entry from every corner of sanctuary, the people can be encouraged to collect at one place and Forest Department can provide amenities like drinking water, medicines and providing various entertainment like rural sports archery etc in this fair. This can help in releasing the emotions of gathered community.
5. The community gathered should be encouraged to formulate the rules of game, which have been distorted over the year. the "hunt" should not use any guns, traps etc. If only ritual is to be completed; some bait like domestic goats, chicken can be used.
6. The services of social and political leaders can also be utilized to disseminate the above point to masses as how this "SENDRA" is causing grave damage to fragile ecology of the area.

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Table-3 Elephant census in dalma sanctuary 1977-1995

Year	1977	1982	1987	1990	1991	1992	1993	1994-1995
Total	62	49	56	68	76	68	61	70
Sub adult	02	09	19	11	13	12	11	18
Female	32	23	34	32	40	31	28	34
Male	22	17	22	22	23	22	24	22
Elephant (Elephas maximus)								

A Report on Elephants in Chhatishgarh and Madhya Pradesh

*Rina Chakraborty and S.Kar

The Guru Ghasi Das (1471. 13 sq km) and the Sanjay (466.88 sq km) National parks covering a total area of 1938.01 sq km, are situated respectively in the states Chhatishgarh and Madhya Pradesh. Chhatishgarh carved out of Madhya Pradesh, came into being on 1st November, 2000, as 26th state of India. Before that the total protected area was named as Sanjay National Park. According to bio-geographic classification of India the whole area is situated under Deccan Peninsula. The area under report is only a part of 6C and 6A (Rodgers et al. 2002) and is surrounded by hills and hillocks and covered with forests, mostly of Sal (*Sorea robusta*) and Bamboo (*Bambusa* sp.) interspersed with *Garuga pinnata*, *Terminalia chebula*, *Magnifera indica*, *Bauhinia vahlii*, *Ficus* spp. etc. A number of rivers viz. Neur, Gopad, Lodhar, Bijadhar, Hasdo, Rihand, Son and their tributaries are passing through the National Parks.

During the last century the wild elephants were not the inhabitant of forests of Madhya Pradesh but they were not uncommon up to the middle of the 19th Century in Central India (Jerdon 1867, Burton 1951), presently known as Madhya Pradesh and Chhatishgarh. Jerdon (1867) stated "It abounds in many parts of Central India, from Midnapore to Mandla and south nearly to the Godavari." At present wild elephants occur in the hilly terrains of the adjacent states viz. Jharkhand and Orissa but not in Madhya Pradesh and Chhatishgarh (Agrawal 1994, Alfred et al. 2002). Their last known habitats in Central India were Surguja, Bilaspur, Raigarh and Bastar in Chhatishgarh and went upto Mandla in to Madhya Pradesh (Verma, unpublished). Elephants are frequent in the forests, covered with tall trees where the ground is hilly or undulating, and where bamboos grow in profusion. They are extremely adaptable and may live in steamy humid jungle or in cool elevated forest (Prater 1980). They used to migrate every year through a particular corridor in the same direction. Since 1988, small herds of elephants from Jharkhand and Orissa are instinctively returning to their former habitat and regarded as intruders. There was a hue and cry to drive back them to their respective states. It was reported that the herds of wild elephants migrate from the adjoining Palamau area to the Chhurchuna forest of Surguja district assuming that the new forest area will provide an ideal abode for them. With the inception of Chhatishgarh state, the district Surguja is divided into two districts, Korea and Surguja. The Guru Ghasidas National Park is situated in Korea district. The elephants, on their way of migration, damage a huge quantity of crops like paddy, maize, barley etc. and also frequently move to the northeast of Chhatishgarh. In 1988, a herd of eighteen elephants destroyed a huge amount of standing crops and village huts and also caused loss of human. lives. Their depredations in this area continued for about five years, and ultimately the forest Department of Chhatishgarh took a decision for capturing them. A Kheda (Drive away) was organized sometime in December- January of 1993-1994 and the el-

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elephants were captured. Thereafter, elephants stopped crossing over from Jharkhand and Orissa. However, since 2001, the wild elephants have again been trying to move through Chhatisgarh and causing depredations in Dharamjaigarh, Jashpur, Raigarh, Korba and Surguja districts.

In October 2003; a herd of eleven elephants were observed in between the northern region of Kotadol range and southern Muluknar of Guru Ghasidas National Park just at the side of Neur River. Another instance of migration of wild elephants to further west was observed on 2nd January 2005 near Ghoka nallah ($23^{\circ} 58' 58.8''$ N & $82^{\circ} 02' 6.07''$ E) in the Kusmi Range of Sanjay National Park in Madhya Pradesh. The herd was comprised of nine elephants including calf, whose mother died within few days after delivery. Thus, it may be opined that the elephants are trying to move towards west making a corridor through Guru Ghasidas National Park or Chhatisgarh state as they were reported earlier in 1998 from Raipur and Madhya Pradesh (Roy 2006). This large beast needs plenty of food, water and track for movement in their daily routine as well as for migration. Both Sanjay and Guru Ghasidas National Parks may provide these facilities to the wild elephants. Thus, lastly it may be concluded that after a detail study, the wild elephants may be allowed to stay in the vast areas of both Guru Ghasidas and Sanjay National Parks or for using as corridor during their migration instead of being compelled to move them out of that area.

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Some Ethological Aspects of *Zygogramma Bicolorata* Pallister (Coleoptera : Chrysomelidae) A Potential Biocontrol Agent of *Parthenium Hysterophorus* L. (Asteraceae)

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Abstract

Mexican beetle *Zygogramma bicolorata* is prominent and promising biocontrol agent of Parthenium weed which causes various health hazards in man. The beetles and its larvae are phytophagous and voracious feeder. Complete weed is destroyed by feeding, breeding and salivary faeces action. Copulation of this beetle occurs both in day and night hours preferably in morning hours and cloudy days. Duration of copulation ranges 30 min. to 18 hrs. average being 8 hours. A preoviposition period of 1 to 4 days is required prior to egg laying. 2 to 5 sec. are required for laying an egg and 1 to 5 minutes are required for laying an egg batch. *Z. bicolorata* perform both local and distant migration, due to this migration it has spread in most of western Uttar Pradesh and lower parts of Uttarakhand. On the onset of winter most of the adult beetles begin to hibernate and fully developed larvae develop into pupae and under go diapause in soil. Hibernation and diapause are broken on rise in temperature during early February.

Introduction

Zygogramma bicolorata Pallister (Coleoptera: Chrysomelidae) is potential biocontrol agent of *Parthenium hysterophorus* (Plate-1A). The later is an obnoxious weed popularly known as congress grass, carrot weed, star weed, fever weed, white top, chatak chandni, bitter weed, ramphool, and hydra headed grass. In India it is widely distributed in parks, gardens, barren lands along water canal or river, railway track and cropped area. It has also invaded the forest area and has achieved the status of worst weed. It is believed that Parthenium possibly got entry from U.S.A. through the imported food grain (Vertak, 1968) or through the cereals got for experimental purpose (Lonkar *et al.*, 1971). Since then, the Parthenium has spread like forest fire throughout India.

Parthenium is poisonous, pernicious, allergic and aggressive weed posing a serious threat to human being and livestock. This weed has been considered as one of the greatest source of dermatitis, asthma, nasal dermal and nasal bronchial type of diseases. Parthenium also causes hay fever and skin problem (Mc. Fadyen, 1980 and Cheney, 1998) other problem due to Parthenium include contamination of seed produce and total habitat change of native vegetation. Besides that it blockse the common pathways and reduce the aesthetic value of parks gardens and residential

Key words- *Z. bicolorata*, *P. hysterophorus*, voracious feeder, feeding behaviour, copulatory behaviour, oviposition behaviour, migration hibernation and diapause.

colonies.

Z. bicolorata, was first introduced to Australia from Mexico in 1980 and subsequently was introduced to India (Jayanth, 1987.) Both adults and larvae of this voracious beetle feed on *Parthenium*, eats every parts of weed except root and main hard stem in north western Uttar Pradesh and Uttarakhand. (Dhiman and Bhargava, 2005 a , b and 2006). Feeding by *Z. bicolorata* has a negative effect on *Parthenium* under field condition (Bhargava, 2006). In this study some ethological aspects of this Mexican beetle are being described.

Material and methods

For the purpose of study, Fourth stage larvae (Plate- 1C) of the approximately same age group were collected in polythene bags by hand picking methods using forcep and soft camel hair brush from the infested *Parthenium* plants. These beetles were brought alive in laboratory and restored in hurricane glass lamp chimneys with fresh leaves of *Parthenium* as food. Wet sterilized soil was also kept inside the chimney at the bottom for pupation of larvae. Soon the 4th stage larvae were transformed into pupae. After 10 to 12 days these pupae develop into adult beetles. These were transferred on caged potted plant of *Parthenium* to know the ethological events of copulation, oviposition, life history and feeding behaviour.

A small watch glass full of water was kept in the chimney to meet necessary water requirement of the beetles. Fresh tender leaves of *Parthenium* were also placed in the chimney as a food source. The lower mid rib portion of the leaf was placed in vial full of water to keep the leaf fresh for longer time. Ten such chimneys were used and each one was placed on a wooden table near a window in laboratory at $27 \pm 2^\circ\text{C}$ temperature. In each chimney 5 pairs of newly emerged beetles were introduced. The stale food was replaced daily with fresh one. A close vigil was kept and feeding behaviour, copulation oviposition and various event of population dynamics, biology and biocontrol efficacy of *Z. bicolorata* were carefully examined.

For knowing migration behaviour, seasonal occurrence and hibernation, keen observation were carried on during four consecutive year and for this various areas and places were extensively surveyed and observation were recorded.

Results

1- Feeding behaviour:- *Z. bicolorata* is a monophagous and phytophagous beetle having mandibulate type of mouth parts. Both the adults and larvae feed on the leaves, inflorescence and tender twigs voraciously (Plate -1) . These avoid hard and more woody stem. Olfactory sensory setae are present in the last antennal segment which help in detecting suitable host for feeding. After landing on the host or after emergence from hibernation the beetles explore feeding site by sensillae of maxillae and labrum and begins feeding on the edge of leaf. Cut the leaf bit by bit by powerful highly chitinized mandibles using adductor and abductor muscles maxillae hold the piece of leaf and direct it into mouth. Labrum and labium prevent escaping of the food out. In the mouth the food is mixed with saliva and this saliva mixed food is passed forward by the activity of pharyngeal muscles which creates strong cibarial action.

Beside this the beetle hold the leaf by powerful claws of forelegs. The beetle or larvae begin to feed one edge of leaf and moves towards mid rib. After devouring a leaf it moves on next leaf and resume feeding again. In between feeding it cleans mouth parts with the help of cleaner comb situated at the tibial extremity of legs.

Ist instar larvae after hatching does not feed for 10- 24 hour and sucks only soft leaf fluid during this period after that it resumes feeding on soft leaf or tender stem. Second to fourth instar larvae are voracious feeders and consume leaf, tender stem or inflorescence with the help of mandible. Rate of feeding in these larvae is higher as compared to adults.

There is no specific time of feeding, it continues throughout day and night with a rest period in between. However, in morning and evening hours rate of feeding increased, while in the noon, larvae and adults went under the leaves to avoid direct exposure to sunlight in summer. In winter even in noon hours feeding continues from dorsal side of the leaf. At this juncture, the adult take short flights to reach other near by food plants or move to other part of the same plant. However, the larvae drop down on the soil and then crawl to near by host plant for feeding. In field trails for biological control of the weed initially, after the release no effect was observed on weed but as the beetle resume feeding and breeding, impact was clearly observed. The beetle first voraciously fed on tender leaves, then on mature leaves and inflorescence and at last on tender twigs and epidermal part of mature stem. Mean time beetle copulated and laid eggs which hatched into young grubs. A close vigil was kept and impact of these beetles on *Parthenium* weed was carefully monitored.

It was observed that the beetle population soon established on the plant after the release. Firstly these attacked the young plants and when all the young plants were damaged then their population distributed on all the plants in this pocket. Beetle population multiplied by using their good reproductive potential.

It was further observed that the entire weed was destroyed by feeding, breeding and salivary action, salivary secretion and defecated blackish faecal pallets on the leaves or stem caused blackish burnt appearance to the plant as well as mould formation.

By the feeding of adults beetles and their larvae firstly photosynthetic factory of plant i.e., leaves and green part were devoured then seed formation ability of the plant was destroyed by feeding on inflorescence and flowers. At last tender twig and bark of stem was also eaten up. Left over of the plants dried up and on the root of such plants fungal growth occurred. Such plants died and decayed leaving behind no trace.

Feeding rate of *Z. bicolorata* on *Parthenium* was recorded as 6 to 14.5 cm² per beetle per day. Rate of feeding increased with higher stage of larvae.

2- Copulatory behaviour: For the studies of copulatory behaviour, newly emerged adults were kept in hurrican glass lamp chimney and watch it carefully at a regular interval of one hour and data were noted in Table -1. Adult *Z. bicolorata* does not copulate at once after moulting from pupae, instead, it need a precopulation period of 3 to 6 days with an average of 3.5 days. This variation in precopulation period depends upon temperature, R.H., food materials, climatic factors and age of copulated partner. The process of copulation takes place at all hour of day and night in lab. as well

as in field condition, preferably in morning hours. It may occur frequently during cloudy day. Observation regarding the mode of copulation has revealed that male always takes active part in approaching the female. It touches the antennae of female by his own antennae and then abdomen and genital part of the female several time. If the female is willing to copulate, she allows the male for it. The male rides over the abdomen of female and holds her with prothorasic legs.

The female becomes inactive and motionless during this activity. In the mean time claspers of male firmly hold the ovipositor of the female and male tries to insert its erected aedeagus into the genital chamber of female. After several repeated attempts, the male get success in his mission. In this position (mounted posture) both the sexes may move or rest at the same spot. During movement the female always play the leading role. Generally, it feeds on host parts or takes some rest or some round on the plant branches. Copulation usually last from 30 minutes to 18 hours with an average of 8 hours. After this, copulating partner free themselves from each other, without showing any affection. After separation, both the sexes travel a sort distance, then clean their antennae as well as rostrum by antennae and cleaner comb present on fore tibial extimities. Then the male takes some rest and begins to feed on *Parthenium*. After 5 to 20 hour of copulation the male prepare for next copulation and goes in search of other copulating partner. It was further noticed that the male does not copulate with the same female before oviposition. But, other male may copulate with this female.

3- Oviposition behaviour : A preoviposition period of 1 to 4 day is required prior to eggs laying. Before oviposition, the female takes a round of oviposition site, viz., *Parthenium* leaves, stem, and inflorescence to select a proper place. It was keenly observed that it select soft leaf, buds and soft stem for oviposition. Generally adults select a healthy plant of weed before oviposition. Generally, eggs are laid on dorsal side of leaf and occasionally on the ventral side of leaf. Besides leaf, eggs are also deposited on stem, inflorescence and buds, after selection of a suitable site for oviposition, it become motionless for a while and holds host surface tightly by powerful claws. Then, from the tip of its abdomen, the eggs start coming out step by step. When the caudal end of the egg is exposed to air, the female then exudes a secretion from the accessory gland with the outgoing eggs. This secretion helps in glueing the eggs with host surface. 2 to 5 seconds are required for oviposition an egg and 1 to 5 minutes are required for laying an egg batch. The female rest for 15 to 20 minutes after oviposition of a batch. Afterwords, she moves here and there for some time and select another place for oviposition and lays another batch of eggs. 1 to 5 minutes are required for inter oviposition period and 2 to 24 hours for the entire process of oviposition period (Table-2). In the laboratory, the eggs were laid on wet cotton swab, on the floor of patridish and on the muslin cloth beside *Parthenium* leaves. Eggs were also found laid on the wall of hurricane lamp chimney as well as on the wooden wire guaze cage. Female lays eggs either singly or in groups ranging from 2 to 12 eggs per group upto 60 eggs are laid during first oviposition period by a female after a copulation with an average of 40 eggs. In the laboratory conditions female laid minimum 10 eggs and maximum 80 eggs, (average being 35 eggs) during a copulation period. The

female laid 3500 to 7000 eggs during life period (before entering into next hibernation), average beings 4500 eggs per female. It is worth to mention here that longevity of female beetle was recorded upto 2 years. It was further observed that fecundity of oviposition decreases with the rise in age of female. Maximum eggs were laid by a 55 to 90 days old female. The maximum number of eggs are laid in March, April and July August and minimum in November (Table-3). Maximum number of unproductive eggs were observed in natural conditions in June and most of the eggs were dehydrated due to high temperature. Eggs (Plate-1) are dark and light yellowish in colour and generally are laid parallel with the host surface when laid singly, while in haphazard way or parallel when laid in group .

4- Life cycle of *Z. bicolorata*

There are four larval stages of creamy white colour and can easily be spotted on the plant, larval duration extends from 3-5 days for first instar, 3-3.5 days for second instar 2-3 days for third instar and 4-8 days for fourth instar .Total larval period lasts from 12 to 19.5 days with an average of 15days.Fourth instar larvae after growth, drop down on the soil near food plant root for pupation.Pupation period normally lasts for 10-12 days in summer and rainy season but it may be increased to 15-20 days in winter. Adult beetles completes own developmental period in 35 days in July and August but it takes 40-50 days in the months of extreem hot and cold (Table-3).

5- Migration of population *Z. bicolorata*

Adults of *Z. bicolorata* are good flier and this beetle perform both local and distant migration. When the host plants of one locality are damaged completely then adults migrate in search of other food plants.

Local Migration:- It occurs in near by vicinity for getting food and for ovipositon. The beetles and its grubs are voracious feeder, whenever a plant is fully devoured leaving behind its skeleton, then the grubs drop down on the soil and crawl to near by vicinity to get healthy Parthenium plants though it takes some minutes or hours to reach the plant and adults go by taking a short flight to settle on new plants. The distance may be of few feets to few meters. Some times beetle also go to other plant by moving on soil. However, on a host plant, after feeding on leaf or tender inflorescence the beetle move to other leaf of the plant or twig simply moving with the help of legs. Larvae (grubs) also crawl for the feeding on different parts of same host. When half plants is damaged then most of the adult beetle migrate to other plants of near by vicinity and on the remaining part of the plants, grubs feed till the entire plant is fully damaged.

These grubs after growth enter into soil for pupation. Grubs are slow mover, these can't reach to other food plant easily, hence for parental care purpose, for the use of their larvae adult beetles abandoned the food plant as said above before damaging it completely. It was also noticed that whenever, plant of a particular site were eradicated by the feeding of beetles then their population easily established on the next generation of plants and kept the weed under control.

Distant Migration:- Distant flight are only performed by adult beetles and these flight are taken

whenever host plants are exhausted or plants are disturbed by biotic agents such as cattle movement or man's interference or fire etc. and climatic factors such as rainfall or air current and intensive light. For taking a flight, beetle prepares itself for it and takes position on the host part peak. Elytra are opened, comes out at 90° angle and then both hind wings are deflated and spread at 90° angle. By beating of these wings flight is taken. At a stretch a beetle fly upto several hundred meters (upto one kilometer). Then lands on any plants or wall or foot path and takes rest and again resume flight. This continues till final destination is achieved. Beetles settles on new food plants and resume feeding and breeding activities.

Some times, beetles cover a mile or so, due to this migration *Z. bicolorata* has been spreaded in most of western Uttar Pradesh parts and also migrated in the near by Uttarakhand area where *Parthenium* is growing. It was also observed that in the comparison to female, male in fast flier while female travel more than male in a flight.

Moreover, some beetle during flight accidentally or by chance, settle on any moving vehicle such as bus, car train, tractor or upon the cattle or some times on the cloth of man which carrier the beetle for away. The beetle from these carriers either fall down or takes flight to settle on the near by food plant. In this way the beetle may cover several hundred kilometer.

6- Diapauses, hibernation and adaptability: *Z. bicolorata* occurs in this region during February to November in natural habitat. During December and January, adults and larvae of these beetles have been rarely sighted. On the onset of winter, all stages of *Z. bicolorata* grow rapidly and in last week of November, most of the adults begin to hibernate in porous and moist soil under the fallen dried leaves or in the crevices of tree trunk or under the bark. The beetles in hibernation remains under dormant stage due to effect of low temperature, 4- 10°C, elytra and wings of beetle were found reduced or elytra becomes some what soft and elastic, colour of the hibernating beetle decrease and turns light.

Hibernation is broken on the rise in temperature during early February and adult beetles come out of their hide outs. Thus taking a period of about 2 to 2.5 months depending upon the climatic conditions. By mid November fully developed larvae drop down in the soil, develop into pupae and under go for diapause, remaining larvae hurriedly completes their larval development by the end of November due to which size of last stage larvae decreases. These too drop down from *Parthenium* plant and enter into soil near the roots of the plant upto the depth of 10 cms and pupate. In these pupae metamorphosis slows down or arrested and too enter into diapausing state.

The diapause is broken in first week of February with the rise in temperature and from these pupae adult beetles emerge out colour of diapausing pupae turns light and resembles with the soil colour (camouflage). Diapause lasts for 2-3 months depending upon climatic factors and food supply.

As said carlier, only few larvae and adults of *Z. bicolorata* have been observed upto December feeding on *Parthenium hysterophorus*. They were found struggling with environment. The size of these beetles decrease upto 2mm and these left over beetles change their colour brown

to dark blackish to absorb more sun heat. It is an adaptation to survive at low temperature and in hilly area.

7- Predators- During present course of investigation one Reduviid predator *Harpektor marginatus* and two ants species (*Camponotus compressus* Fabr. and *Solenopsis geminata* Fabr.) were observed feeding on beetles. *H. marginatus* is a potential predatory bug found in north western U.P. in good number in the agricultural field area as well as forest areas. It is red coloured active bug which hold the larvae or adult by fore legs and then extends its rostrum to pierce it by maxillary and mandibulate stylets. It then injects some proteolytic or lysing enzymes through saliva. The host is paralyzed and after that the bug sucks the body's fluid or dissolved substances. Pupae of *Z. bicolorata* escaped the predation by *H. marginatus* because the pupae are found 2-10 cm deep buried in soil near the root of Parthenium. However, when pupae were supplied to *H. marginatus* in lab they fed on them.

The bug has high adaptation and capability for unfavourable condition and it can live upto 2 months in starved condition at room temperature and R.H. The bug is polyphagous and has a wide range of prey. It is also observed showing cannibalism in absence of other prey, it attacks the members of its own species and suck its body content. Thus the predator *H. marginatus* decreases the biocontrol efficacy of *Z. bicolorata* to control the obnoxious weed *Phyterophorus* upto some extent. Trap of predator from weed area can improve the survival and control efficacy of this beetle.

Discussion

Studies on ethological aspects of insects are of paramount significance. On this aspects in Chrysomelidae little work has been carried out particularly on biocontrol agents. In noon of summer the larvae and adults of *Z. bicolorata* go under the leaves to avoid direct exposure of sunlight while in winter even in noon hours, feeding continues on dorsal side of the leaf also and colouration of beetle gets dark to absorb heat from sunlight. Sushil Kumar (2005 a & b) said that adult beetle hide themselves among the curly bunch of the old leaves of the plant during day time in May – June.

Feeding rate of *Z. bicolorata* on Parthenium was recorded as 6 to 14.5 cm² per beetle and 8 to 20 cm² per grub per day. Rate of feeding increased with higher stage of larvae. However, Swamiappam *et. al.* (1997) mentioned potential consumption as 144.3 mm² of Parthenium leaves per beetle per day.

On its reproductive biology only scarce information is available. Female lays eggs either singly or in group ranging from 2 to 12 eggs in a group on leaves, flower, stem, and buds of Parthenium. Jayanth and Bali (1993a) observed only 6 eggs in group while Sushil Kumar (2005 b) mentioned 3-5 eggs in a group, Gautam (2002) and Pandey *et. al.* (2001) counted 1-4 eggs and 4-6 eggs in a group respectively further a female beetle lays maximum 80 eggs with an average 35 eggs after one copulation. Pandey *et. al.* (2001) mentioned 60 to 65 eggs per day while Jayanth and Bali (1993 a) recorded 45 eggs per day. There is variation in the number of eggs laid by a beetle during life time. It was observed that a female laid 3000 to 5500 eggs with an average 4500

eggs per beetle during life time in laboratory. Jayanth (1987) Said that adult beetle laid on an average of 1802 eggs while Jayanth and Bali(1993b) mentioned 2500 eggs per female similar to Pandey *et. al.* (2001).

During the study it was noted that maximum number of eggs were laid by 55 to 90 days old female while according to Sushil Kumar (2005b), the maximum number of eggs are laid in 7th to 15th week with a peak during the 9th week. Total larval period last from 12 to 19.5 days with an average of 15 days .Panday *et al.* (2001) mentioned 12 days larval period, while Jayanth and Bali(1993a) and Gautam (2002) reported 11-13 days and 13-16 days larval duration respectively. Fourth instar larvae after growth drop down on the soil near food plant root for pupation upto the depth of 2 to 10 cms. Pupation period normally last 8-12 days but it may be increased to 15-20 days in summer and winter, Sushil Kumar (2005a) and Gautam (2002) reported as 6-12 days and 5-6 days respectively .

Migration is natural phenomenon in insect for getting better environmental condition for food, shelter and breeding. No other information is available by other with aspect of *Z. bicolorata*. During present course of investigation three predators namely *Harpegnathos saltator* and two ants species (*Camponotus compressus* Fabr. and *Solenopsis geminata* Fabr.) of this biocontrol agent have been observed feeding on beetles. Gupta *et al* (2004) also reported some species of predatory bugs namely *Andralus spindidens* Febr. *Cantheconidea fercellata* Wolf and *Sycanus pyrrhamelas* Walker as predator of *Z. bicolorata*.

Over wintering in adult and diapause in pupae lasted upto mid February taking a duration of about 2.5 to 3.0 months in district Saharanpur and adjacent area. Bhan *et. al* (1997) mentioned 8-9 months diapausing period in Jabalpur. According to Pandey *et. al.* (2001) *Z. bicolorata* occurred in May to September and finished infestation when the rain was over in Hardwar.

Thus variation in over wintering or diapausing period is found in *Z. bicolorata* this variability is due to different climatic condition of the country. On this aspect further research work is needed so that beetle may be available throughout the year for eradication of obnoxious weed Parthenium.

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Table- 1
Copulatory period of *Z. bicolorata* in laboratory

Adult emerged		Copulation started on		Pre copulation period (in days)	Compulation Finished		Duration of copulation including rest in between
Date	Time	Date	Time		Date	Time	
14-02-2003	8.00 AM	18-02-03	6.00 AM	4.0	18.02.03	9.00 PM	15.0
16-05-2003	6.00 AM	21-05-03	7.00 PM	4.5	22-05-03	5.00 AM	10.0
06-04-2003	6.00 AM	08-04-03	8.00 RM	2.0	08-04-03	1.00 PM	5.0
11-05-2004	7.00 PM	14-05-04	6.00 RM	2.5	14-05-04	12.00 PM	18.0
16-06-2004	3.00 PM	19-06-04	5.00 PM	3.0	19-06-04	5.30 PM	30 ,in.
20-07-2004	5.30 PM	22-07-04	8.00 PM	2.0	22-07-04	12.00 AM	4.0
30-08-2004	7.30 PM	01-09-04	6.00 AM	1.5	01-09-04	2.00 PM	8.0
16-02-2005	11.30AM	19-02-05	8.00 AM	3.0	19-02-05	2.00 PM	6.0
25-05-2005	7.30 PM	29-05-05	6.00 AM	4.0	29-05-05	6.00 PM	12.0
01-07-2005	5.00 PM	07-07-05	4.00 AM	6.0	07-07-05	1.00 PM	9.0

Table – 2
Preoviposition and oviposition period of *Z. bicolorata*

Copulation finished		Oviposition started		Preoviposition Period	Oviposition finished		Oviposition Period after	Number of laid eggs
Date	Time	Date	Time		Date	Time		
22-07-2003	6.00 AM	24-07-2003	5.30 AM	2	25-07-2003	5.30 AM	24	85
01-09-2003	11.00 AM	05-09-2003	10.00 AM	4	05-09-2003	8.00 PM	10	15
01-06-2004	5.30 PM	04-06-2004	6.00 AM	2.5	04-06-2003	9.00 PM	15	15
10-07-2004	12.00 AM	12-07-2004	11.00 AM	2.0	13-07-2004	6.00 PM	18	35
14-03-2005	6.00 PM	18-03-2005	7.00 AM	3.5	18-03-2005	11.00 AM	4	20
10-05-2005	4.00 PM	13-05-2005	4.00 PM	3	14-05-2005	10.00 AM	20	22
08-07-2005	6.00 PM	09-07-2005	5.00 PM	1	10-07-2005	8.00 AM	15	65
20-08-2005	8.00 PM	22-08-2005	7.00 AM	1.5	22-08-2005	9.00 AM	2	45
25-09-2005	6.00 PM	29-09-2005	6.00 AM	3.5	30-09-2005	7.00 AM	24	58
05-11-2005	7.00 PM	08-11-2005	6.00 AM	3.0	08-11-2005	7.00 PM	12	35

Table – 3
Rearing of *Z. bicolorata* with life cycle data

Date of first Copulation	Date of laying 1st eggs batch	Total number of laid eggs	Date of hatching	Number of eggs hatched	Incubation period (in days)	Date of moulting of larvae				Total larval period (in days)	Pupal period (in days)	Number of adults emerged	Total developmental period (in days)
						Ist	IIInd	IIIrd	IVth				
15-03-2003	18-03-2003	25	25-3	18	7	30-03	03-04	06-04	10-04-03	16	10	15	33
21-07-2003	24-07-2003	85	30-07	50	6	03-08	06-08	09-08	11-08-03	12	8	43	26
01-09-2003	05-09-2003	15	14-09	10	9	19-09	22-09	25-09	30-09-03	16	9	8	34
15-02-2004	20-02-2004	15	28-02	12	8	03-03	06-03	09-03	14-03-04	13	12	9	33
10-07-2004	14-07-2004	22	20-07	18	6	23-07	26-07	28-02	01-08-04	12	9	10	27
20-08-2004	24-08-2004	39	01-09	33	8	05-09	08-09	13-09	18-09-04	17	8	21	33
25-09-2004	27-09-2004	45	06-10	35	9	10-10	13-10	18-10	23-10-04	17	10	19	36
01-11-2004	04-11-2004	42	16-11	20	12	21-11	24-11	27-11	02-12-04	18	15	6	45
12-04-2005	20-04-2005	12	28-04	10	8	02-05	05-05	08-05	13-05-05	15	8	9	31
18-05-2005	22-05-2005	65	29-05	45	7	02-06	05-06	09-06	15-06-05	17	18	25	42
01-07-2005	04-07-2005	58	12-07	52	8	15-07	18-07	20-07	24-07-05	13	8	38	29
15-08-2005	18-08-2005	72	24-08	65	6	27-08	30-08	01-09	05-09-05	12	8	55	26



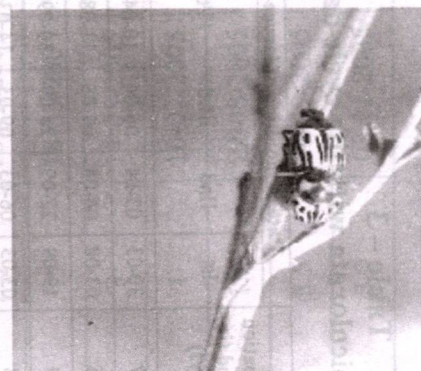
A



B



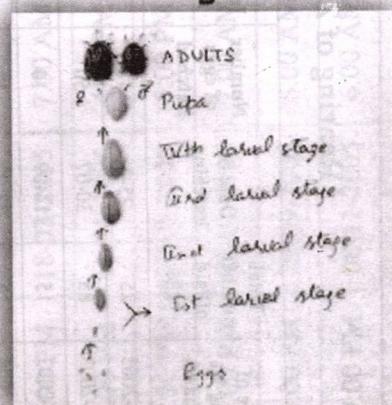
C



D



E



F

Plate - 1 (A) Healthy plants of Parthenium,
(D) Adults in copulating stage

(B & C) Beetle and larva feeding on leaf,
(E) Fresh eggs (F) Life cycle of *Z. bicolorata*.

बुद्धिमान जानवर चिम्पेंजी (वन मानुष),

Chimpenzee(*Pan troglodytis*)

*डॉ. लालसिंह राजपुरोहित

कशेरुकी प्राणियों (chordates) में स्तनधारियों (Class-Mammalia) के कुल 16 जीवित गणों (living orders)में प्राइमेट्स(primates) गण का जैविक विकास की दृष्टि से सर्वोच्च स्थान है। जिसमें बहुत छोटेबन्दर (उदाहरण के तौर पर मारमोसेट(Mormosets), टुपिया(Tupia), लेम्यूस(lemurs), व लोरिसेज(Lorises) आते हैं) से लेकर अन्य बड़े बन्दर(Moeaques), लंगूर (langurs), बेबून (Baboon), ऐप्स (Apes) एवं मनुष्य स्वयं आता है। ऐप्स (Apes) बिना पूँछ वाले उच्चतर प्राइमेट्स (Higher Primates) हैं जिनमें गिबन (Gibbons), ओरंगउटन(Orangutan), गौरिल्ला (Gorilla) व वनमानुष या चिम्पेंजी (Chimpanzee) आते हैं। जैविक विकास में चिम्पेंजी ही मनुष्य के सबसे नजदीक हैं।

चिम्पेंजी सबसे अधिक बुद्धिमान वानर (primate) है। ये अफ्रिका के गिनी प्रदेश से लेकर कांगो, युगाण्डा, रूआन्डा, नाइजीरिया तथा विक्टोरिया झील तक पाये जाते हैं। ये मनुष्य जैसी सूरत वाले स्तनधारी वानर हैं जिन्हें 'वन मानुष' भी कहा जाता है। इनके केवल एक जोड़ी पसलियाँ अधिक होती हैं। और इनमें शब्दों के रूप में बोलना (Verbal communication) नहीं होने से मनुष्यों जैसा विकसित समाज नहीं बना पाते हैं। चिम्पेंजी, गौरिल्ला तथा ओरंगउटन से आकार में छोटे होते हैं। और गौरिल्ला की तरह भयानक भी नहीं दिखते हैं बल्कि हंसेड़ लगते हैं। इनके मुँह पर खूँखारी की जगह बुद्धिमानी की झलक रहती है। अन्य नर वानरों (Apes) की अपेक्षा ये ज्यादा समझदार होते हैं। इन्हें आसानी से कुछ भी सिखाया जा सकता है। ये गौरिल्ला से कम ताकतवर होते हैं तथा उनसे ज्यादा समय पेड़ों पर बिताते हैं।

एक व्यवस्क नर चिम्पेंजी की ऊँचाई 1.5 मीटर तथा वजन 60 से 75 किलो ग्राम रहता है। इनका सिर ऊपर के चपटा, ललाट दबा हुआ, मुँह चौड़ा, नाक चपटी, कान बड़े तथा उभरे हुए रहते हैं। इनकी भुजाएं अन्य वानरों की अपेक्षा छोटी होती है, परन्तु पैर काफी विकसित रहते हैं। ये कभी-कभी दोनों पैरों पर मनुष्य की तरह खड़े भी चल सकते हैं, परन्तु जमीन पर ज्यादातर अपने चारों हाथ—पैरों की सहायता से ये तेजी से पेड़ों पर चढ़कर शाखाओं पर झूलते नजर आते हैं।

पूरा शरीर चिम्पेंजी का काले घने बालों से ढका रहता है, केवल इनके चेहरे तथा हथेलियों व पाँव के तलुवों पर बाल नहीं होते। इनके सिर, कंधे व पीठ पर बाल घने रहते हैं परन्तु पेट व छाती पर कम बाल होते हैं। बूढ़े होने पर इनके मुँह पर भी भूरे बाल आ जाते हैं। चिम्पेंजी एक सामाजिक प्राणी है तथा कम उम्र के रहने तक मनुष्य से दोस्ताना व्यवहार रखते हैं। मनुष्य के हर आचरण का अनुसरण करते हैं। सिखाये जाने पर ये मनुष्य की भाँति मेज कुर्सी पर बैठकर चमच से खाना खा सकते हैं।

ये किसी बड़े पेड़ पर अपना मचान जैसा घर बनाते हैं। दिनभर इधर-उधर झाड़ियों में खाने की खोज में फिरते रहते हैं। शाम होने पर हर रात नया मचान (घर) बनाते हैं। ये कभी-कभी घूमते-घूमते 10-15

किलोमीटर तक चले जाते हैं। इनका मुख्य भोजन वनस्पति ही है। ये फल, पत्ते, केले, अन्नानास, कोको, नई कोपलें आदि खाते हैं। परन्तु भूखे होने पर कीड़े-मकोड़े, अण्डे आदि भी खा जाते हैं।

चिम्पेंजी छोटे बड़े झुण्डों में रहते हैं। वयस्क नर उनका मुखिया होता है। एक झुण्ड को जंगल में रहने के लिये (Home range) करीब 10-12 वर्ग किलोमीटर क्षेत्र की आवश्यकता होती है। मादा चिम्पेंजी 32 से 34 सप्ताह (करीब 8.5-9.0 महीने) बाद प्रायः एक बच्चे को जन्म देती है। इन नर वानरों की अपनी भाषा के तहत कई तरह की आवाजें (Vocalizations) निकालकर आपस में संदेश आदान-प्रदान करते हैं। साथ ही हाव-भाव (Body postures-Languages) द्वारा भी एक दूसरे के साथ संवाद बनाये रखते हैं। मनुष्य की तरह ये भी छूकर व हाव-भाव से वार्तालाप का काम करते हैं।

शारीरिक ढाँचे में मनुष्य जैसे होने के कारण ये वैज्ञानिक प्रयोगशालाओं के लिये महत्वपूर्ण हैं। मनुष्यों की कई बिमारियाँ इन पर भी उतनी आसानी से असर करती है। इसलिये नई दवाइयों व टोकों (Vaccines) के प्रयोग एवं उनके प्रभाव इन नर वानरों पर देखा जाता है, उचित लगने पर ये दवाइयाँ व टीके मनुष्य के लिये प्रयोग लेने के लिये उपलब्ध कराई जाती है। इन वन मानुषों का प्रयोग अन्तरिक्ष यात्रा में भी किया जाता है और अलग-अलग स्थितियों में इस तरह की यात्रा के प्रभावों का अध्ययन किया जाता है।

सन् 1960 से पहले तक तो इनकी वास्तविक जातियाँ कितनी हैं इसका निश्चित पता नहीं था। बाद में देखकर पहचानी जा सकने वाली मुख्यतः दो प्रजातियाँ हैं—

1. साधारण चिम्पेंजी—Common Chimpenzee (Pan troglodytis)

ये गिनी के निचले हिस्से (अफ्रीका में), नाइजीरिया, कोम्बे, उगाण्डा, व कांगो में पाये जाते हैं, इनका चेहरा, चमड़ी, हाथ-पैर काले होते हैं तथा शरीर पर काले घने बाल होते हैं।

ऊपरी गिनी में पाये जाने वाले चिम्पेंजी का रंग कुछ भुरा सा लगता है। इनके बाल छोटे व भूरे होते हैं तथा कान भी पीले व बड़े होते हैं। इन्हें मास्क चिम्पेंजी (Mask chimpenzee) कहा जाता है।

2. बौने चिम्पेंजी—Pigmi chimpenzee (Pan paniscus)

ये आकार में छोटे होते हैं तथा गिबन से आकार में मिलते हैं। इनकी सख्या काफी कम रह गई है और ये साधारण चिम्पेंजी के उपरोक्त क्षेत्रों में नहीं पाये जाते। ये कांगो नदी के दक्षिणी किनारों पर पाये जाते हैं। जो लुप्त प्रायः (endangered Primate) प्राइमेट हैं।

**किसी को भी हमारे कारण दुःख न हो, यही है सुखी होने का मार्ग
स्वयं की भूलों को देखने वाला ही इन्सान बन सकता है।**

क्या मनुष्य के पूर्वज मंदबुद्धि थे ?

21 जून, 1998 —सेन डियागो (संयुक्त राज्य अमेरिका) स्थित कैलिफोर्निया विश्वविद्यालय में मानवशास्त्र (Anthropology) की प्रोफेसर केंटरिना सेमेंडफेरी ने दक्षिणी अफ्रीका के 30 लाख वर्ष पुराने आदिमानव की खोपड़ी के जीवाश्म की आधुनिकतम यंत्रों से परीक्षण कर बताया कि हमारे पूर्वज मंदबुद्धि थे। वह इसलिये भी कि उनके कपाल छोटे आकार के थे, और इस कारण उनका मस्तिष्क भी छोटा था। ठीक इसी तरह की जानकारी सेंट लुईस स्थित वाशिंगटन विश्वविद्यालय के प्रोफेसर ग्लेन कोनराय एवं उनके सहयोगियों के अध्ययन से भी उजागर हुई है। 30 लाख वर्ष पहले हमारे पूर्वज आदि मानव नाटे कद और पूरे शरीर पर बाल वाले थे, जो अफ्रीका के जंगलों में भ्रमण करते थे और फल-फूल खाकर रहते थे। वर्तमान मनुष्य का विकसित मस्तिष्क एक क्रमागत विकास की देन है और इसे इस स्वरूप में आने में करीब 30 लाख वर्ष लगे हैं। उस समय उनके कपाल (मस्तिष्क) का आकार 400 क्यूबिक सेन्टीमीटर (400cc) के बराबर था। और वर्तमान में हमारे मस्तिष्क का आकार लगभग 1200 क्यूबिक सेन्टीमीटर (1200 cc) के बराबर है। हालांकि क्या बुद्धि की तीव्रता और विकास के लिये मस्तिष्क का आकार में बड़ा होना आवश्यक है? यह एक ऐसा प्रश्न है जिसने आजकल वैज्ञानिकों को उलझन में डाल रखा है। आकार भी निर्णायक भूमिका निभा सकता है, परन्तु यही एक मात्र निर्णायक तथ्य नहीं है। मनुष्य के मस्तिष्क की जटिलता एक रहस्य ही है पर किसी न किसी दिन शीघ्र ही इस रहस्य से भी परदा उठेगा।

मादा गुरिल्ला आदमी के बच्चे की माँ बनी

मई, 2001 में वैज्ञानिक दृष्टि से शायद अब तक की सबसे अद्भुत घटना में नेपल्स (इटली) के वैज्ञानिकों ने एक मादा गुरिल्ला की गर्भ से मनुष्य के बच्चे को जन्म दिलाने की एक अनूठी उपलब्धि हासिल की। डॉ. मारियो बेसिलियो तथा उनके सहयोगी ने नेपल्स के राष्ट्रीय अजायबघर में मीना नामक इस गुरिल्ला के सीजेरियन प्रसव कराया जिसमें उसने (मीना-मादा गुरिल्ला) एक स्वस्थ मानव शिशु (लड़की) को जन्म दिया। मारिया नामक इस शिशु लड़की का वजन करीब आठ पौण्ड (करीब 3.6 किलोग्राम) था जबकि उसकी गुरिल्ला माँ की उम्र उस समय 14 वर्ष और वजन 350 पौण्ड (लगभग 160 किलोग्राम) था।

इटली के इस शहर में 2001 में 39 वर्षीय एंजेला कीवीन और उसके पति कारियो की 1992 में शादी के बाद से कोई संतान नहीं हुई थी। हालांकि एंजेला ने कई बार गर्भधारण किया था लेकिन हर बार किसी न किसी कारण से उसका गर्भपात हो जाता था। यह युगल डॉ. बेसिलियो व उनके सहयोगी से मिला जिन्होंने उन्हें कृत्रिम प्रजनन व भ्रूण विकास की तकनीक अपनाने की सलाह दी जिसमें उनके अंश से तैयार भ्रूण को किसी अन्य औरत की कोख में या सरोगेट मदर (आम भाषा में किराये की कोख) में विकसित कराकर प्रसव कराया जाता है। यहाँ एंजेला अपनी बड़ी बहन के कटु अनुभव से वाफिक थी जिसमें बच्चे को जन्म देने वाली महिला पैसा लेकर भी बच्चा सौंपने से मुकर गयी और अदालत में दावा अलग कर दिया। अतः काफी सोच-समझ कर एंजेला व उसके पति कारियो ने गुरिल्ला को सरोगेट

A Trip to Tarai Are Landscape

*Rajeev Raj Mehta

Having travelled quite a lot in and around Rajaji National Park (RNP) Sona Nadi and Corbett Tiger Reserve in the past 18 years. I was rather more than eager to travel across Tarai Are Landscape on Indian side along with a team of experienced veteran wildlife experts, scientists, photographers from W.W.F. International and W.W.F. US- Dr. Eric Dinerstein, Dr. Eric Wikramanayke and Dr. Bivash Pandav.

I had the honour and the responsibility of driving the above three senior scientists through the magnificent Indian Terai arc landscape. The entire trip for me personally has been a learning experience and a fascinating one.

We began our journey on 19th Jan. 08 at 3.15 P.M. from Wildlife Institute of India, Dehradun and entered R.N.P. from Mohand after seeking permission from the Director R.N.P. and drove through Dholkhand-Beribada-Ranipur to Chilla for a night halt. In this particular area from Mohand to Ranipur the Wild ungulate pray species specially Sambhar were regularly sighted, though surprisingly, no signs of Tiger use were evident at all in the same area which is a matter of concern.

On the 20th morning we drove upto Mandal Chowki in Chilla range sighting a lot of Cheetal and Sambhar and a few king vultures. From the Chowki we were accompanied by Abhishek Harihar who has been camera trapping Tigers in R.N.P. for last three years for W.I.I. We all drove into the Mahendra Ghati where we sighted a couple of female elephants and a little while later on our way back we came across fresh Tiger Pugs of both adult Male and female at different locations. The female in fact had freshly sprayed 3 times on trees within a distance of about 200 meters. We stopped a little further for about ½ hour just to sense any Tiger movement or activity and were happy to hear him give a big snarl/roar. We moved back to the Chowki to make sure that we don't disturb her.

Our night stay was at Kolhuchaur in Landsdown Forest Division and we reached the FRH in the evening after a gruelling but a fabulous drive through Mithawali-Rasoolpur-Laldhang – Kotdwar-Saneh. The route from Saneh to Kolhuchaur FRH is 9½ kms and is a very rough and tough terrain. One must travel in a flour wheel drive Jeep for sure and that too in good condition. The road twists and turns up and down in and out of river beds with plenty of water. The Kolku river have to be crossed 11 times. The flora and fauna are breath taking. The area is a super habitat for the TIGER with ample ungulate pray species. Goral sightings are common and so is elephant movement. The area is also a great place for birding. Some of the species that we came across

*Chitra Cinema, Near Railway Station, Hardwar, Uttarakhand.

were common King Fisher, Pied Kingfisher large Pied, Kingfisher white, capped Red start, paradise flycatcher, Grey hornbills, Pied hornbills, Bulbuls etc.

We also had the pleasure of observing and photographing a elephant herd (3 adult female, 2 sub adult male and 2 juvenile females) on a steep chiff licking salt at a natural salt lick. It was a amazing sight to watch them climb up and down with such ease. I must mention this sight to be amongst the best I've seen and observed in Wild. It was astonishing as well as funny to see how the young ones climbed up and down the cliff.

After two nights halt we drove through some magnificent terrain first upto Chaukham where we sighted fresh pug marks of a female and a male Tiger within 4 kms. and then drove out to Nauri onto the tarmac road. The entire stretch is full of undisturbed flora and fauna. The water pools are crystal clear and deep but have no fish. We all wish and hope the few Gujars living at Koluchaur and a few near Nauri are relocated at the earliest as they all too are willing to do so. It will do wonders to this entire area.

From Nauri we drove through the Northern boundry of C.T.R. through Sendikhal Vatanvasa, Mundiapani and Rathuadhab along the Palain river and Mandal river until we climbed to Kanda (The highest point. of C.N.P.) and then descended to Dhikala for a night halt. The journey from Koluchaur to Dhikala took us a little over 5 hours. Due to heavy rains this year there was excess water in the Ramganga Reservoir and Phulai chaur and Lead Khalia were inaccessible. Next morning we drove around Dhikala to Thandi Road – Mota Saal – Sambhar Road – Khinnauli – Neebubojhi – Kamar Patta, sighting elephants, Barking Deers and lots of Cheetal and Sambar. The sight of the day were 2 yellow throated martins at Thandi road and around 25-27 hog deers in beautiful morning light that was ideal for photography. Later we proceeded to wards the exit at Dhangari Gate through High Bank, Crocodile point and Gairal stopping at Crocodile point for about 40 minutes watching 3 Ghariyals and thousands of Golden mahaseer fish along with Gunchh. The sight was splendid.

Through Ramnagar we drove for a Night half at Chorgalia. Early morning next day we walked from Machali-Van towards Durga people upstream along the river Nandaur. The area showed regular movement of the leopard and good sightings of bird life. We were however disappointed not seeing any other signs of wildlife in this splended area. The deep pools of water had no fish at all. We returned to the FRH, where D.F.O. Haldwani Shri Ghansham Rai had organised a workshop for the front line staff to be addressed by the WWF Scientists. Dr. Eric Dinerstein spoke about the rhino in detail as he is a Rhino expert. Later Dr. Bivash Pandav addressed the group, talking in detail about the Elephants, Tiger, besides motivating the staff regarding their role in conservation of forests and wildlife. The workshop was a big success and the staff seemed interested in what the scientists had to say to them.

After the workshop we drove off to Jaulasal and Senapani with a night half at Jaulasaal. The journey was tough, tiring and slow. The roads were very bad mainly because a lot of movements of Trucks in this area extracting tonnes of wood and magnificent bamboo for Uttarakhand forest Development Corporation. We all wondered how this could be stopped. The entire area is a very good habitat for Tiger. The area needs special attention and if sincere measures are taken to stop poaching of ungulates & other pray species and also stop the movement of trucks, we could have great chances of reviving the Tiger here. In the year 2000 Senior Field Officer of the Operation-eye of the Tiger India in the comments register of the Jaulasaal FRI had mentioned that he did not come across any tiger movement and he felt that poaching somehow had to stop. Today, almost a decade later having travelled the same routes, in and outside the protected area I feel the same, as did Shri N.S. Negi. There is an emergency, and we need to do much more.

From the Archives of "Cheetal"

The First General Body Meeting, 19th April, 1959

The first General Body Meeting of the Wild Life Preservation Society of Northern India was held on the 19th April, 1959 at Dehradun, a little over a year after the Society was formed (on the 13th April, 1958). The gathering was fairly well attended. Several non-members were present by invitation. The Maharaja of Nabha, the President of the Society, was in the chair.

Before the meeting commenced tea was served, the main item of which was a huge cake presented by the President to mark the first birthday of the Society, and which was much appreciated. The society's flag (a cheetal head on a green background) was flown and a group photograph was taken. The agenda of the meeting is reproduced here, as well as the speeches of the President and the Hony. Secretary and the auditor's report with statement of accounts.

The revised constitution of the society was considered and it was decided to have it vetted by a small sub-committee, with a view to later registering the society under the Society's Registration act. A feature of the revised constitution is the addition of Educational (teachers) and Professional (Forestry and soil conservation, agriculture etc.) members at half the Ordinary membership rates, and of Family members at double the rates; the provision for commutation of membership for life by payment of 10 years subscription, and for conversion of these categories of members to Life Membership within 5 years on payment of the difference.

Four sub-committees, for Legislation, Fishing, Publicity and Propaganda and Education were formed, as follows:-

(1) Legislation

1. Shri P.D. Stracey, I.F.S., (Chairman and Convenor).
2. Shri K.S. Srivastava, Advocate 11, Circular Road, Dehradun.
3. Shri M. Mitchell, Arcadia Tea Estate, Dehradun.
4. Shri S.S. Negi, C.E. (Retd.), Karanpur, Dehradun
5. Shri J.N. Onial, Honorary Secretary
6. Shri T.S. Negi, I.P. (Retd.) Rajpur Road, Dehradun.
7. D.F.O. Dehradun Divn. (Ex-Officio).

(2) Fishing

1. Sardar Gurkirat Singh Mann, Chander Road, Dehradun (Chairman and Convenor).
2. Military College, Premnagar, Dehradun.
3. Shri O.D. Jackson, Survey of India, (Retd.) 6, Curzon Road, Dehradun.
4. Major Mainwaring, Cambrian Hall, Dehradun.
5. Shri R.L. Holdsworth, The Doon School, Dehradun.
6. Shri M.A. Edwards, Edwards Building, Dehradun.
7. D.F.O. Saharanpur Divn. (Ex-officio).

(3) Publicity

1. Shri R.L. Holdsworth, The Doon School, (Chairman and Convenor).
2. Shri P.D. Stracey, I.F.S., Dehradun.
3. Brig. Gambhir Singh, Surveyor General of India, Dehradun.
4. Shri S.P. Sahi, F.R.I. Dehradun.
5. Shri J.N. Onial, Honorary Secretary.
6. Shri Bhagwan Das Khorana, Assistant Honorary Secretary.
7. Shri H.K. Dang, The Doon School, Dehradun.

(4) Propoganda and Education

1. Shri S.P. Sahi, F.R.I. Dehradun, (Chairman and Convenor).
2. Representative of F.R.I. Wild Club, Dehradun.
3. Shri Narendra Singh, Colonel Brown School, Dehradun.
4. Shri M.A. Rashid, F.R.I. Dehradun.
5. Dr. R.S. Gupta, Soil Conservationist (Retd.), Chakrata Road, Dehradun.
6. Shri V.K. Sharma, F.R.I. Dehradun.

The Second issue of the "Cheetal" magazine made its appearance at the meeting and was distributed to members, as also the Society's tie (dark green with small cheetal head on it), the society's buttons and member's cards. Absent members were invited to apply to the Honorary Secretary for these.

The meeting was a great success and came to a conclusion with a vote of thanks to the chair.

The advice tendered by Chief Justice Manchanda (Retd.) of the Punjab High Court on the question of the constitution was much appreciated and he was thanked for having taken the trouble

of coming to the meeting, as also Mr. Hamid Ali, I.C.S. (Retd.) brother of Mr. Salim Ali, the famous ornithologist.

Speech of H.H. of Nabha, the President of the Society.

In welcoming the members present, the President explained that it was not possible to send the audited report of the accounts and the Secretary's report to the members before the meeting and asked to be excused. The President then went on: "Details of the work done during the year is contained in the Secretary's report, so I will confine myself to general remarks.

The society, on the whole, deserves to be congratulated on the progress made. There appears to be genuine interest in the problem of saving wild life in the country, to judge from the response from the public during the short time of one year and we expect further progress in the year to come in enrolling members, increasing the funds and expanding the work of the society. It is also expected, now the teething stage of the society is over, that attention can be focused on publicity and propaganda work, which is the main plank of the society. With greater support behind it the society can press Government to improve their rules and their enforcement machinery.

In these respects, the progress so far has been admittedly rather slow, even allowing for the proverbial slowness in such matters. The proposals made by the society have covered a wide range of action to protect wild life and while they have been welcomed in most quarters there is no sign yet of their being implemented on a wide scale. Forest officers, who are the primary guardians of wild life in the country, have a great responsibility in this connection and I would respectfully urge heads of the forest departments to exert the maximum pressure on their Governments in the interest of wild life.

The question whether our society should enlarge its jurisdiction at this early stage is to be seriously considered and we hope that the members present will express some opinion on this. Our constitution provides for the formation of branches, but so far no branches have been opened. This is essential, for broad-basing our activities. In this connection, there is a certain amount of confusion in the minds of a lot of people as to the difference between the scope and functions of a society such as ours and more scientific organisations (like the Zoological Survey of India and the Bombay natural History Society) and Wild Life Boards. Our society is pledged to work directly for wild life and we do not propose to encroach on the field of scientific work of a research or taxonomic nature. As regards Wild Life Boards, they are purely advisory bodies and are strictly limited in strength to the few members nominated by the Government. A society, on the other hand, can embrace a considerable section of the public and to that extent its voice is much more representative. Such an organization of private individuals is free, moreover, to express its opinion frankly and embracing as it does many experienced shikaries and knowledgeable persons in wild

life, it can put forward proposals with complete confidence that they are the best possible under the circumstances. When I say this, I do not wish to decry the great authority wielded by such boards, which are composed of important and knowledgeable persons. I merely wish to point out that the functions of a wild life board and a society like ours are not entirely similar and on the contrary, are complementary to each other. Moreover, a private society like ours has greater scope in publicity, propaganda and educative work for wild life, even in these days of Governmental activities in such matters, subject of course to the availability of funds.

We are anxious to broaden our organisation and take it down to the level of the student and the rural dweller, for it is in the hands of the youth of our nation and of the agricultural and rural dwellers, who live with animals and birds outside their doors as it were, that the future of our wild life heritage lies. For this we require to prepare projection material, such as slides and cine films, based on Indian examples and showing Indian settings. We also require enthusiastic people who will utilise such projection material in rural areas and among students. We shall have to, in this connection, seriously consider the employment of whole time workers who will act for us as 'inspectors' of wild life and who will carry out the necessary propaganda and publicity for us in rural areas and in educational institutions. In this respect, I am sure, many of our members can help in the course of their wanderings on shikar. The education of the young by lectures and talks is a task which is particularly suited to most of our members.

The task that we have set ourselves is no easy or small one. Persons have asked; "What do we get out of the society? What do I get for the money that I pay? What is being done for our members?" I am afraid we can offer very little in return to our members except the journal, which I think you will all agree with me, has been a great success and the knowledge and feeling that they are working to save wild life for posterity.

I am sure you will all join with me in wishing the society a long life and continued success.

I will now ask the Secretary to read this report."

The first meeting of Wildlife Preservation Society of India, Dehradun (19th April 1959)



Chairs : Major M.A.R. Skinner, Sh. Hamid A. Ali, I.C.S. (Retd.), S. Gurkirat Singh Mann, Sh. P.D. Stracey, I.F.S. (Vice-President), H.H. The Maharaja of Nabha (President), Sh. J.N. Onial (Hon. Secy.), Sh. Manchanda, S. Ranbir Singh, Sh. B. Mitchell,

1st Row Standing : Mr. Harrison Taylor (U.S.A.), Mr. O.D. Jackson, Sh. K.S. Srivastava, Sh. K.S. Mehta, Sh. K.L. Mehta, Sh. S. Gupta, Sh. A. Oswald, Sh.B. Wadhvani, Sh. Narindra Singh, Sh T.S. Negi (I.P. Retd.) Sh P.N. Bahri, Sh. Y.M.L. Sharma, Sh. S.A. Shah, Dr. R.S. Gupta.

Back Row : Sh. Tej Bahadur Singh, Sh. A.L. Rao, Capt. Norton, Dr. B. Frank (U.S.A.), Dr. S. Krishan Swamy, Sh. S.P. Sahi, Sh. A. Rashid, Sh. K.K. Nair, Sh. M.A. Edwards.

"Cheetal" quarterly News

Welcome New Members

The enthusiasm to join Wildlife Preservation Society of India has continued to grow. The following members are welcome to the Society.

Sl.No. Name & Address of Members

Kind of Membership

- | | | |
|----|--|-----------------------------|
| 1. | Monika Chopra, Proprietor, SE
Second Floor, Shahpur Jat,
New Delhi-110049 | Institutional member Annual |
| 2. | Indrajeet Singh, Director,
C-E-5, 1 st Floor
Shahpur Jat, New Delhi-110049 | Institutional member Annual |
| 3. | The Principal AVC College
Mayiladuthurai (Autonomous)
Mannampandal-609305 (TN) | Institutional member Annual |
| 4. | Divisional Forest Officer

Nanda Devi National Park | Institutional Life Membe |
| 5. | Neha Nautiyal,

Rajaram Vihar, Danda Lakhond
P.O. Gujrara, Dehradun-248001. | Student Member |
| 6. | Yousuf Jaheer
Director, Himalayan River Runners
Village Kottisari, PO Shivpuri,
Distt. Tehri Garhwal. | Life Member |
| 7. | Vaibhav Kala, Director
S-507, Ground Floor
Greater Kailash-2
New Delhi-48. | Institutional Life Member |

- | | | |
|-----|---|---------------------------|
| 8. | Anshu Mittal
Coordinator, Shahil Foundation
452/1 Kaulagarh Road
Street No. Z A, Rajendra Nagar
Dehradun. | Institutional Life Member |
| 9. | Director, Zoological Survey of India
M Block, New Alipore
Kolkata-700 053. | Institutional Member |
| 10. | Agonomi Sarkar
111 Sri Aurobindo Sarani
Kolkata 700 006 | Student Member |
| 11. | Dr. K.P. Kamthan
Reader, Deptt. of Botany
D.A.V. College
106/103 Gandhi Nagar
Kanpur. | Annual Member |
| 12. | Dr. P.K. Bajpai, Reader
Deptt. of Zoology,
D.A.V. College, Kanpur. | Annual Member |
| 13. | Dr. S.C. Dhiman
Reader, Deptt. of Zoology
M.S. College Saharanpur,
U.P. 241001. | Annual Member |

Wildlife Preservation Society of India Dehradun conducts a Nature Trail in Chakrata

With the financial support from Uttarakhand Council of Science and Technology, WPSI conducted a nature trail on 29 and 30 June 2008. Members of WPSI participated in the trek cum trail from Kanasar to Deoband and Deoband to Chakrata on the same day. Kanasar to Deoband is a 10 km trek through beautiful dense Devdar forest with breath taking landscape starting at an elevation of 7500 and culminating at 9000'. Participants had their pack lunch at Deoband Forest Rest House and completed second phase of trek to Chakrata another 10 km distance descending from 9000' to 7300'. The trekking was jointly done with a group of trekkers from Sahil Foundation which is life members of WPSI. In all there were 35 participants out of which 21 took part in the trek. On 29th evening a talk was given to all the participants on role of citizens in conservation of

Environment by Mr. A.S. Negi, IFS (Retd.), Executive Vice President of WPSI. A short trek was organised at Kanasar on 29.6.08 upto Koti and back to acclimatise the participants and give them a practice of walking in Hills. The trek was conducted by Mr. Negi who helped the participants in nature interpretation and identification of flora and fauna. There were many first timers who had tough time. The youngest member was Master Vikram Aditya aged 10. The members had to brave not only the steep climb but rough path and rain for sometime. The participants described the trek as unique, educative and a life time experience. We had some excellent photographers with us who got ample opportunity to fulfill their hobby. At the end of the trek the members wished to have many more such experiences in future.

The next trek is schedule in second fortnight of September to Dodital in Uttarkashi district in which more members of WPSI are expected to participate.

SC-govt standoff over forest wildlife

New Delhi : The full-blown confrontation between the UPA government and the supreme Court on forest and wildlife issues may just turn nastier.

The environment ministry has proposed definitions of 'forests' that under mine the apex court's order which defined which lands should be classified as forest and therefore be off-bounds for development and mega projects. In its haste, the ministry has not even waited for the final report of its consultant, hired to generate a new definition.

A 1996 apex court order had greatly increased the area that came under the ambit of a very stringent Forest Conservation Act, 1980, which regulates use or transfer of 'forest' for non-forest activities, such as mining, hydropower and other mega-projects. The apex court had instructed that any patch of land having some forest on it should be regulated by the forest Act regardless of the status granted to it in government records. This had become a major grouse of the pro-industry lobby, which had to seek clearance for use of such 'forests' and of the tribals as well for curtailing their rights.

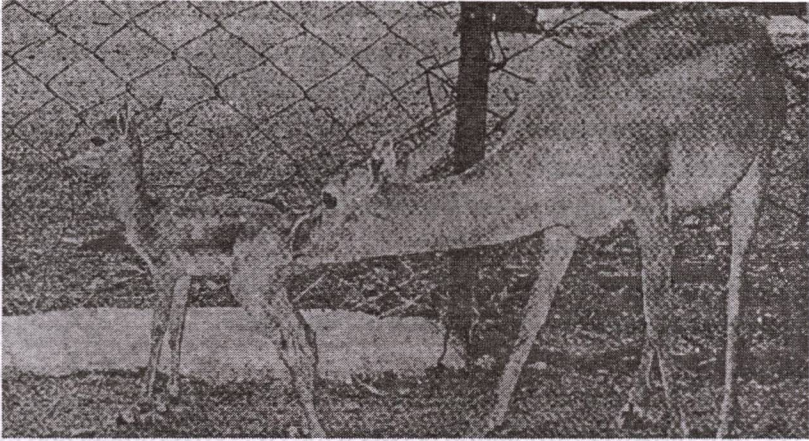
With the government putting up three draft definitions of 'forests' for comments on its website, all challenging SC's definition, the move to legally enforce a new definition has picked up speed. What has raised eyebrows is that the entire exercise of consulting outsiders has gone on even as the ministry quietly devised a definition along with a new Forest Act.

"The definition the ministry had generated earlier while drafting the new forest legislation could end up being a fait accompli despite this exercise of consultation," a well-placed source told The Times of India.

The consultancy for defining forests was given to a Bangalore-based research organisation, Atree, after it won the bid submitted against a tender put out by the ministry for the assignment. The organisation has held several rounds of discussions within and outside the ministry but has only submitted a rough draft and not its final report, sources informed The Times of India

Source : The Times of India, New Delhi. August, 11, 2007

Blackbuck through artificial insemination
CCMB Claims this is the first time in the world such a thing has happened



RARE BIRTH: 'Blacky', the new-born blackbuck fawn, with its mother at the Nehru Zoological Park in Hyderabad.

PHOTO: BY SPECIAL ARRANGEMENT

HYDERABAD : Indian scientists have produced a fawn from a blackbuck through non-surgical artificial insemination, stated to be the first time in the world.

Blackbuck is a highly endangered species and the 1990 census reported only 38,000 animals. It is the fastest of Indian antelopes and found all over the country except the north-east. It is also the State animal of Andhra Pradesh and called nalla jinka in Telugu.

A 2.6 kg female named 'Blacky' was delivered on Thursday noon by one of the three blackbucks inseminated six months ago. The project was carried out by a group of scientists from the Laboratory for the Conservation of Endangered Species (LaCONES) of the centre for Cellular and Molecular Biology (CCMB)

The scientists said this was an important breakthrough that would give a thrust to conservation of endangered animals.

Addressing a press conference here on Friday, CCMB Director Lalji Singh, one of the two principal investigators of the project, said, "We are so excited, we want to share the excitement with you." For the first time in the world, blackbuck was produced through assisted reproductive technologies, he claimed. He said that surgical intra-uterine insemination, an invasive procedure, had led to the birth of young ones of the cheetah, leopard, puma, wild cat and deer in other countries. The technique of artificial insemination is not commonly applied in wild animals although routinely practised in domesticated ones. The government gave permission for carrying it out to produce the endangered blackbuck only after the CCMB successfully demonstrated the technique in spotted deer earlier. S. Shivaji, Director Grade Scientist, the other principal investigator, described as "very good" the 33 per cent success rate in producing blackbuck through artificial insemination

Nicobar pigeon

He said the government had also given permission to undertake artificial insemination to increase the population of the Nicobar pigeon, another endangered species, and vulture, whose population dwindled by 90 per cent.

Dr. Singh said AI would significantly contribute to the maintenance of genetic diversity and conservation of endangered animals. He said LaCONES would like to use the technique eventually on leopards, lions and tigers. Efforts were also on to clone laboratory animals.

Source : Hindu, Aug, 25, 2007

'Nobody can kill animals near our Villages'

Avijit Ghosh

Bagda ki Dhani: For Bishnois in Bagda ki Dhani near Jodhpur, the scars are still fresh after Salman Khan was caught for poaching blackbucks. "We protect deer, rabbit, chinkara, blackbucks, blue bulls, peacocks and many other animals. The good news is that since Salman Khan was sent to jail, nobody comes to kill animals near our village," says Babulal Bishnoi, a rich farmer with 85 bighas of land.

Back in the 18th century, 363 Bishnois were martyred trying to stop trees from being felled at Khejarli village. The new generation of Bishnois have continued the community's love affair with trees. Dinesh, 15, has planted five neem and safeda saplings. Premi Bishnoi, a 13-year-old girl, has sowed two neem and one safeda saplings. "Trees are good for the environment. Everybody likes greenery," she says. Who would disagree?

Source : The Times of India, New Delhi. August, 30, 2007

Hotels near tiger reserves may have to pay for conservation

Nitin Sethi

New Delhi : Should a part of the money you pay private hotels and tour operators to see a tiger in the wild be spent on saving the very same tiger? the environment and forests ministry and state forest officials will take a call on this on Thursday when they decide if hotels and tour operators should pay 30% of their revenue for conservation of the beleaguered cat and reduce the problems of villagers displaced by the creation of such reserves.

The plan is part of the wildlife Ecotourism Guidelines that the ministry has proposed but is finding some opposition from the states.

The ministry has proposed that hotels and lodges within a radius of 5-km from the boundary of a reserve must contribute 30% of their turnover to the tiger reserve, since the industry draws advantage out of public funds invested in preservation of the park. But to help the tourism sector at the same time, the ministry is keen that the industry get a 100% tax exemption on the revenue used to protect the reserves.

Following the recommendations of the PM's tiger Task Force, the government is keen that a local level body- involving panchayats, the district magistrate and forest officials- be given a critical role in regulating tourism in the areas around tiger reserves.

The task force had found that tourism around tiger reserves in many cases could provide substantial funding for upkeep of the parks, paying salary of field-level staff as well as become a source of income for villagers on the periphery of the reserves.

In Ranthambore Tiger Reserve, it had recorded revenue from the hotels on the periphery exceeding Rs 1 crore per annum - much more than the annual support from the Centre for most of the 28 tiger reserves in the country.

Source : The Times of India, New Delhi. Sept., 7, 2007

Wildlife lobby to corner PM on the Forest Act

Nitin Sethi

New Delhi : Resistance to implementation of the Forest Rights Act has increased with wildlife groups and experts getting together to mount pressure on Prime Minister Manmohan Singh to set up a panel to examine the "adverse" impact of the legislation on national parks and sanctuaries.

The wildlife groups plan to present a joint front when the National Board for Wildlife, which the PM chairs, meets on November 1. They have already shot off a letter to Singh and their plea will only complicate matters for the PM as he is under pressure from his left allies to implement the Act. Some well-known conservation groups like WWF, Bombay Natural History society, Wildlife Protection Society of India, along with influential figures like Valmik Thapar are all on the National Board for wildlife. They have demanded that the board set up a sub-committee to examine the Act's impact on wildlife, national parks and sanctuaries.

The board is the apex body on wildlife issues under the Wildlife (Protection) Act, 1976. It is required to meet at least once a year and take up policy level issues. The board comprises, besides key ministries and officials, several non-governmental organisations and individuals that the government nominates. The board has a pre-planned agenda on which it takes decisions annually.

This is the first time that the board will see such an aggressive ganging up of non-governmental groups ahead of its meeting as wildlifers try and get the government to review the Act passed by Parliament. Their voices will only add to the pressure being exerted by Congress circles to delay implementation of the Act that was passed by Parliament more than nine months ago.

The 14 conservation groups and individuals have demanded that henceforth, all legislations or changes in existing statutes having implications on forests, wildlife or protected areas be first approved by the board.

Source : The Times of India, New Delhi. November, 2, 2007

Wildlife groups file PIL against Forest Act

New Delhi : In what could be a fresh headache for Government, a petition challenging the consti-

tutional validity of a pet UPA project - the Forest Rights Act aimed at giving land rights to traditional forest dwellers - has been filed by some prominent wildlife groups in Supreme Court. If accepted, the case could be a spoke in the wheel for the government which has backed the forest law after considerable opposition from wildlife lobbies. The move by the Mumbai-based Bomay Natural History Society, Delhi-based Wildlife Trust of India and Bhubaneswar-based Wildlife Society of Orissa marks another chapter in this confrontation.

The PIL also shows that the truce the Congress leadership had tried to thrash out with tiger conservationists to keep protected areas-national parks and sanctuaries -outside the purview of the Forest Rights Act has broken down. A three-member Bench of the apex court, headed by the Chief Justice, will hear the petition on Friday.

Adding to the government's woes could be a claim of conflict of interest when the petition comes up for hearing. The "friend of the court" or amicus curiae Forest Bench, Harish Salve, has already made his opposition to the Act clear in a public meeting on February 16. "It (the Forest Rights Act) is an unabashed attempt to put politics over environment. If the Act is implemented in letter and spirit, you as well wind up the forest department," he had said.

The Act, which along with the National Rural Employment Guarantee Act, is meant to showcase Congress's propoor credentials, had earlier run into opposition from the powerful wildlife lobby. A section of this group had approached the Congress leadership claiming that the Act would harm wildlife and forests. After long delay, government then moved to buy peace by keeping tiger reserves out of its ambit. More controversially, it operationalized a part of the Act to keep other national parks and sanctuaries out too, even while the Act's legal notification was kept in abeyance.

later, two prominent critics of the Forest Rights Act and government's wildlife policies, Valmik Thapar and Mahendra Vyas, were placed on the sub-committee of the PM's National Board of Wildlife to review impacts of legislations on wildlife. They were also made members of the environment ministry's panel meant to hasten process of safeguarding non-tiger national parks and sanctuaries before the Act's notification.

Source : The Times of India, New Delhi. Feb, 21, 2008

Did Yamuna water kill Chambal gharialys?

Experts Now Say Reptiles May Be Dying Due To Contaminated Food Or Toxic Water

Neha Shukla

Locknow: This tale has all the contours of a tragedy. Consider the facts: Chambal lost over 100 gharialys in the last 72 days to a "mysterious" toxin released, in all possibility, by its very own sanctuary-the river Yamuna. Vets involved in the probe have confirmed that toxins caused around 103 deaths. And though the picture is still a bit hazy, they unanimously agree toxins came from either the contaminated food or the Yamuna water. Samples of the viscera and river water were sent to laboratories like IVRI(Bareilly), DRDE in Gwalior, IITR(Lucknow) and also to labs in Bhopal,

Sagar, pune and Jabalpur. "We would be able to comment with surety on the cause of deaths only after we have all the reports in hand. However, the two aforementioned reasons are foremost on our minds," a wildlife expert told TOI on Wennesday.

There are worries that the toxin might have begun to affect other freshwater species and the carcass of a 'magar' (another crocodilian species) which was fished out recently could be an early warning. "We can't comment on what caused the death of the magar till the postmortem report comes," said a senior representative from the crisis management group formed in this regard.

"One leading theory here is that there could have been a onetime release of the toxin in Yamuna, which reached Chambal during monsoons with the backwaters and the effect of that toxin is showing now because it takes time for any foreign substance to get incorporated in the food chain or in the water river," said another group member.

After almost three months since 16 bodies were fished out from Barchauli village in Etawah range of national Chanbal Sanctuary on December 8, it is gout which has been noted in regularity in all 103 carcasses. The bodies show uric acid deposition in visceral organs and also, in joints of animals. This point towards kidney failure and toxin, according to the findings so far, as the cause. It is the confluence of Yamuna and Chambal, which is the affected stretch of the sanctuary between Sahson and Kheda Ajab Singh in Etawah. The sanctuary runs through three states of Uttar pradesh, Madhya pradesh and Rajasthan.

Apart from 200 to 250 ghariyals found in Nepal, most of the remaining 1,500 are found in three Indian rivers-Son, Geruwa and Chambal. Close to 700 are found in Chambal alone. But, the rate with which these animals are dying, experts fear, the conservation efforts so far will be almost undone.

बच्चों के लिए जरूरी है नेचर आउटिंग

बच्चों को प्रकृति से जोड़ेगा 'गो विद नेचर'

साहिल फाउंडेशन का कन्जर्वेशन एजुकेशन प्रोग्राम

DEHRADUN: प्रकृति से दूर होते जा रहे बच्चों के मानसिक व शारीरिक विकास के लिए जरूरी है, कि उन्हें प्रकृति के पास लेकर जाया जाए जिससे वे प्रकृति को बेहतर ढंग से समझ सकें. बच्चों के विकास के इस पहलू और शिक्षा व पर्यावरण विषय पर विभिन्न क्षेत्रों के विषय विशेषज्ञों ने अपने विचार व्यक्त किए. मौका था साहिल फाउंडेशन के एजुकेशनल प्रोग्राम 'गो विद नेचर' के इन्फोर्गेशन पर आयोजित हुए प्रिंसिपल मीट का.

प्रकृति और शिक्षा पर चर्चा

मीट में रीटायर्ट चीफ कन्जर्वेटर ऑफ फॉरेस्ट और एडिशनल



प्रिंसिपल ए एस नेगी ने प्रकृति और उसमें समहित एलीमेंट्स पर विस्तार से जानकारी दी. साथ ही उन्होंने प्रकृति से दूरी बनाने के चलते बच्चों पर पड़ने वाले नेगेटिव इफेक्ट्स पर भी प्रकाश डाला. श्री नेगी के अलावा प्रोग्राम में यूएफडीसी के रीजनल मैनेजर डॉ. एसडी सिंह, वेल्हम बॉयज के टीचर एसएस खैरा, डॉ पीसी बनर्जी और साहिल फाउंडेशन से अंशु मित्तल ने विषय से सम्बंधित विभिन्न तथ्यों पर रोशनी डाली.

नेचर प्रोग्राम के विविध रंग

खासतौर पर शहर के बच्चों को प्रकृति और गांवों से जोड़ने के लिए शुरू हुए इस प्रोग्राम में समय-समय पर विभिन्न गतिविधियों का आयोजन किया जाएगा. साहिल फाउंडेशन से अंशु मित्तल ने प्रोग्राम के बारे में जानकारी देते हुए बताया कि इस प्रोग्राम के तहत स्कूली बच्चों को जंगलात के दूर पर ले जाया जाएगा. इसके अलावा बर्ड वाचिंग और बटरफ्लाई आइडेंटिफिकेशन के लिए बच्चों को ले जाया जाएगा. प्रोग्राम के तहत रैपलिंग, रॉक क्लाइम्बिंग, कैपिंग, सॉफ्ट एडवेंचरस स्पोर्ट्स और लिविंग विड एनिमल्स जैसी एक्टिविटीजका भी आयोजन किया जाएगा. प्रोग्राम के इन्ोग्रेशन पर आयोजित हुए मीट में लगभग बारह स्कूलों के प्रतिनिधियों ने भाग लिया.

साइंस डे पर प्रदर्शनी की तैयारियां

DEHRADUN (23 Feb): साइंस डे के उपलक्ष्य में सर्वे ऑफ इंडिया की ओर से निबंध और मॉडल प्रतियोगिता कराई जाएगी, साथ ही प्रदर्शनी का आयोजन भी किया जाएगा. साइंस डे पर निबंध प्रतियोगिता का विषय पर्यटन में मानचित्र का महत्व और मॉडल का विषय प्लैनेट अर्थ खोज, शोध व बोध है, जिसमें 9 वीं से 12 वीं कक्षा तक के स्टूडेंट्स हिस्सा ले सकते हैं. उन्हें अपनी निबंध और मॉडल 25 फरवरी तक सर्वे ऑफ इंडिया के ऑफिस में जमा कराना होगा. 28 फरवरी को मॉडल प्रदर्शनी 9 से 12 बजे तक लगाई जाएगी और प्रतिभागियों को पुरस्कार वितरण भी किए जाएंगे. कार्यक्रम का संचालन अनिल वर्मा करेंगे.

"Cheetal" Young Readers Section

Should man Conquer Nature?

*Sumit Sinha

Should man conquer Nature? This is the question we are trying to answer here. But implicit in this question is the assumption that man is at war with Nature. The antagonism between man and nature is presupposed. And this is the root cause of all our troubles. Let us see how. If we presume that man is at war with Nature, then there is no other option but to conquer it for the sake of our survival. But what if this presumption is an exaggerated sense of paranoia of man? A diseased state of human mind? A persecution complex? What then? then the mankind will spend itself in conquering the non-existent war with Nature. So, the question 'Should man conquer Nature?' reduces to 'Is man at war with nature?' in essence. Let us try to answer this.

This origin of the assumption that man is at war with nature dates back to the very origin of man. The primeval man was afraid and helpless in front of Nature's forces. The only way he could reconcile with this was to worship it as a Force. This attitude more or less continued till science gave the humans the tools to confront and 'conquer' it. He could escape floods and droughts, combat various diseases and this gave him a confidence like never before. As a result we now see things differently. We have placed man against Nature. Nature with its deadliest of deadly weapons like floods, tornadoes, earthquakes, droughts, diseases and so on. These all appear to be bent upon destroying human existence and we no longer try to appease them with prayers, we try to 'conquer' them. Man is a born winner or at least he thinks he is. He has seen such things from time immemorial, he has survived these and he will emerge winner in the future too. Isn't this what many of us suppose? But some other learned men see things differently. They say 'Mother Nature' with a sudden softness and respect in their voice. Mother they call it because she feeds us, pampers us and cares about us. So what is the truth? Is Nature an enemy or a Mother? Or simultaneously both? or none? The answer is none. It cannot be our enemy because our own existence depends upon it. Every breath we take is of course a complex mixture of gases carefully mixed so as to make it a life-giving potion. The food we eat is even more complex gift for our survival. So the nature appears to be a mother but actually no. Because the air we breathe was not designed for the purpose of our breathing neither the food we eat was intended to feed hungry men. The human species has found a way of living with them, because if we weren't able to utilize them we would have been finished for good. And we came to gain these abilities through nature's process of evolution. Just like so many other species on this planet! Nature is neither an enemy nor a Mother but a neutral force which creates and sustains all the species of this planet and we need to understand this force to live with it properly.

Human are desperate to live. In fact we all want to live; and when I say 'We', it also includes all the living beings that exist today- the amoeba that causes dysentery, the limbless snake, the mould growing on our breads and the birds that chirp and sing. Everyone wants to live, but no one interferes with Nature the way man does. Humans don't want to die even when Nature wants them to. For this we clash with nature.

Man has ended up in a negative role vis-a-vis Nature and we are playing it out beautifully. We have made 'resources' out of other species of plants and animals and have no compunctions in exploiting them. But one might argue that this process is a part of food chain, every species acts as a source of food for some other species. Why blame only humans? Here we need to realize that every species contributes to nature, everyone who eats also gets eaten as a part of the chain. But not humans. Man is terminal in the food chain. You remove man from Nature and life will continue without a hitch. You remove frogs and all the species of that ecosystem will perish; life will crumble because the chain will be broken. Our planet will become just another heavenly body in the sky. In this way man is useless in nature but this does not affect Nature much until man starts to affect Nature itself. This means that we are not supposed to interfere with Nature. But in this desperate attempt to conquer Nature, man has disturbed the natural equilibrium. He wants an easy going life. Tick Tock. He needs homes to live and fields to grow food, so he clears forests; he needs a rocking chair so he cuts trees; other animals are a nuisance to him so he doesn't want them either. Man needs business, since there is a huge market for products for huge population. Products are made from natural resources (if at all we are supposed to call them resources!). The major watershed in this direction was the industrial revolution during eighteenth century. This combined with the then dominant religious-philosophical view that man is the center of the universe, that all bounties of Nature are meant for his pleasure, has accelerated this downfall. Since the industrial revolution, world has become a global market (and a global dumping ground too!). Machines must make products; products must be moved from this corner of the planet to that. This entails burning of more and move fossil fuels (which we learnt to draw from deep beneath the earth's surface). This means more pollution, more release of green house gases into atmosphere. This pollution is mostly responsible for disturbing the natural balance of gases and elements. The green house gases like carbon dioxide, nitrous oxide, methane etc are produced by anthropogenic processes like rapid industrialization, burning of fossil fuels and deforestation etc. These severely affect nature by trapping heat energy and resulting in rise in sea levels due to melting of polar ice caps and glaciers. This causes changes in climatic patterns and occurrences of freak cyclones and tropical disturbances. And we blame Nature for this!

Similarly, the use to chloro-fluoro-carbons (CFC's) a major industrial and household chemical, has led to the depletion of ozone layer to as low as 50% at some places. The UV rays freely enter the atmosphere and play havoc by causing diseases like cancer in all living species and destroying plant life. Even the rivers are so much polluted by human activities that it is now beyond Nature's power to cleanse them. Most of the rivers today contain toxic metals such as arsenic,

mercury and other harmful chemicals such as ammonia, cyanides and organic wastes etc. most of it coming from industries like heavy metals, pesticides, fertilizers, etc. In India alone, millions of liters of untreated sewage are being dumped into the rivers. But who cares?

Nowadays it is raining acid in our metros. Literally. Nature has gone berserk. Weren't she supposed to rain water instead of acids? Why is she behaving so erratically all of a sudden? Let us see. The pollutants like sulphur dioxide, nitrogen oxides and aerosols released by human activities accumulate in atmosphere and react to form acids, causing acid rains. It increases the acidity of the aquatic medium, so much so that the already frail Aquatic life system is threatened. Plankton, algae, crustaceans and fishes etc. which survive in a narrow pH range (acidity levels) have reached the brink of extinction.

So this is what is being done in attempt to conquer nature in the name of so called human progress. Sadly, all such problems increase multiple times with increase in human population. Unlike other species, man cannot keep his population in a constant sustainable equilibrium. Man just multiplies and multiplies, Utilizes all available resources of a particular area until they are finished. Then he spreads to other parts of the planet, proliferating like a cancer.

We refuse to see it, but nature has started to collapse since the arrival of industrialized humans. We have made a mess out of nature trying to handle and control it. And we are not in a mood of stopping even now! We are learning still newer ways to clash with Nature. The introduction of nuclear energy is certainly the quickest way of bringing destruction. The nuclear wastes are being accumulated beneath our soils and seas, raising the temperature of the oceans considerably and causing grand malfunction of natural cycles. The deadliest arsenal of man- the nuclear bomb is bound to explode sooner or later because man loves war. He has used bombs earlier also and will do it in the future also. If such a scenario happens, the temperature of the earth will be raised by several times followed by a nuclear winter. The climate cycle will come to an abrupt end, sun's energy will not reach the earth's surface, water bodies will be contaminated and every form of life will vanish forever.

May we ask ourselves who we are to play with Nature in such an irresponsible manner?

We should try to answer some very uncomfortable questions without any prejudice :

1. Is nature our ancestral property?
2. Is there any need to tamper with nature to fulfil our greedy progress?
3. Who has given us the authority to do so?
4. Who is responsible for the damage done so far?
5. What is going to be the end of this story?(if nothing is done now, there is certainly going to be an end to this sorry story.)
6. What shall we do now?

This is the million- dollar question- what shall we do now? Is there any getting back? Can

nature be restored? The situation is grim and steps must be taken now.

Universal laws should be formed to protect Nature, laws that do not change from country to country, be it developed or third-world. Everyone must abide by these laws. Minimum forest area must be ensured and maintained by each country. Industrialization must be controlled. Unnecessary experiments with nature must stop. Methods must be devised to control and decrease existing pollution. But doing all this will not be easy. We have formed committees and participated in conferences, made laws and laid conventions. But all on paper. Also, the awareness levels of the public are depressingly low. Let the general masses know the real situation. Most of us are living with a false belief that everything is going to be all right. Man has conquered nature before and will surely find an answer to this problem now also. But the real problem is that most of the people don't even know that there is a problem in the first place. There are others who simply refuse to acknowledge this due to their vested interests. Conventions would be put up and laws would be made but what is important is to enforce them. It is our moral and ethical responsibility to abide by them.

If we still wish to conquer Nature then definitely we are on a road to nowhere. There have been many examples earlier when man thought himself in control of nature but was severely disillusioned. In medical sciences for example man used drugs and antibiotics to treat and conquer many diseases but they have sprung up again, in forms resistant to all our latest drugs. So we must learn that we cannot compete with nature because we ourselves are nothing but a creation of Nature.

We now realize that the war with Nature will be not only a self-defeating one but also actually a self-annihilating one. We need to change our arrogant mindset and realize our position in the grand scheme of Nature. We must realize that the 'resources' of Nature are limited and are not intended for sole use of humans. All species have an equal right to them. We have to keep a symbiotic and cooperative relation with nature as all species do. We have to move from blind progress towards a model of sustainable development. Only then is there any hope for our survival.

It's a beautiful world and if we open our eyes and see carefully enough, we will find green letters inscribed on it saying - "Fragile, Handle with care."



डोडो पक्षी कहां गायब हो गये?

डोडो (Dodo) एक प्रकार की भोली-भाली बड़े आकार की चिड़िया थी, जो कई सौ वर्ष मारीशस टापू पर पाई जाती थी. (मारीशस टापू हिंद महासागर में स्थित है, जो मेडागास्कर के पूर्व में 900 किमी की दूरी पर है. इसका क्षेत्रफल 1843 वर्ग कि०मी० है) इस पक्षी का आकार बड़ी मुर्गी के बराबर था. इसका वजन 23 किग्रा के लगभग था. इसके पैर और पंख छोटे-छोटे होते थे. अतः यह उड़ नहीं सकती थी. कहा जाता है कि यह पक्षी केवल मारीशस में ही मिलता था।

इस चिड़िया का पता सबसे पहले सन् 1507 में पुर्तगाल के यात्रियों ने लगाया था. इसका डोडो नाम भी उन्होंने ही रखा. डोडो शब्द का अर्थ होता है — मूर्ख. यह चिड़िया वास्तव में ही मूर्ख थी. यह इधर-उधर उड़कर शत्रुओं से अपनी रक्षा नहीं कर सकती थी. इसको पकड़कर और मारकर भोजन के रूप में इस्तेमाल करना बहुत ही आसान काम था. पुर्तगाली यात्री और उनके साथ आए कुत्ते और बिल्ली इस पक्षी को मारकर आसानी से खा जाते थे. इतना ही नहीं कुत्ते और बिल्ली इसके अण्डों को भी खा जाते थे. इस सबका परिणाम यह हुआ कि इस पक्षी का वंश ही समाप्त हो गया. सन् 1681 तक तो यह चिड़िया पूरी तरह से लुप्त हो चुकी थी.

पुर्तगाली यात्री इस अवधि में बहुत से डोडो यूरोप में लाए थे. 1638 में एक जीती-जागती डोडो लोगों ने लंदन में देखी थी. अब तो इस चिड़िया के केवल चित्र ही देखने को मिलते हैं. इन चित्रों को मारीशस से प्राप्त डोडो की हड्डियों के ढांचे के आधार पर बनाया गया है. इस पक्षी के हड्डियों के ढांचे इंग्लैण्ड और अमेरिका के कई अजायबघरों में रखे हैं ।

Family Life of Birds

Arun didn't realize if but the birds outside his window weren't singing for joy. To a bird, singing is a serious matter – an important part of the breeding season. That's because singing is a bird's way of establishing its claim to a breeding territory, defending that territory, and, at least for some species, attracting a male.

The Season for Singing



The male Magpie-Robin, lora, Golden Oriole, Shama, Malabar Whistling thrush, start singing from February onwards, to proclaim their breeding area and also to announce their presence to would be spouses in the nearby area. The Koel and Common Hawk-Cuckoo start advertising their presence as the spring proceeds onwards. The Black Drongo's sweet song starts from June onwards. Greyheaded Flycatcher, Redbreasted Flycatcher, Large Cuckoo-Shrike and a few other birds sing late in the year when they are setting up and defending winter territories. But singing is much more common and energetic from the beginning of spring to end of monsoon, as it is the main breeding season for many of the Indian birds.

Male songbirds usually do all of the singing, although the female Indian Robin, lora and a few other females sometimes sing too. A bird's song means different things to different birds in the neighbourhood. To the males, it usually means "Keep off, this is my place!" But to females of the same species it may say "Here I am and I am looking for a mate!"

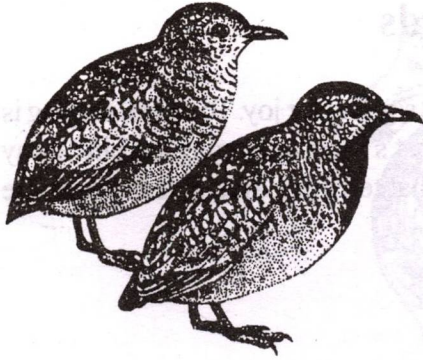
How do birds "become" singers? Through research, ornithologists (scientists who study birds) have discovered that some birds learn the characteristic songs of their species by hearing other birds singing it. But the songs of some other birds are completely innate. It means that a bird "knows" and can sing its species song without ever hearing it. For many birds, the song is somewhere in-between, being partially learned and partially innate.

Song Vs. Calls:

A bird's song is usually made up of several notes that the bird sings in a regular pattern, over and over again. Sometimes a singer will vary its song slightly, but the overall pattern of notes stays the same e.g. Singing Bush Lark. Not every note a bird utters a part of its song, though. Birds also have calls. These are sounds they make during feeding, migration, or when danger is near. Unlike songs, calls are usually short-made up of one or a few short notes.



Great Indian Bustard



Common Bustard Quail

Thump, Strut and Drum:"

No all birds are singers. But even some of the ones that aren't, make different kinds of noises to defend their territories or to attract mates. For example a male Lesser Florican jumps perpendicularly upto two metres in the air emitting a croak-like sound, which is audible for a couple of kilometers away. It serves to attract females and repel rivals from its territory. In the same way a male Great Indian Bustard utters a deep booming call audible upto a kilometre or so and starts strutting from a slightly elevated place. Rufous, Indian Goldenbacked, Threetoed, and Great Black Woodpeckers make drumming sounds by hammering tree trunks or bamboos. In Indian Button Quails and Little Bustard-Quails, the female, who has several husbands, establishes her territory and proclaims her presence by loud drumming calls. This warns rival females against trespassing her territory and attracts the males.

Displays that Dazzle:

Singing, hammering, and thumping all help different kinds of birds find each other during the breeding season. But for many birds, sight is much more important than sound when it comes to finding a mate. Colour, special courtship feathers, and movements all play a big part in some birds' courtship displays. Peacocks, for example, parade in front of the females, fanning and shaking their long colourful feathers.

Equally spectacular is the display of the Sarus Cranes. The male and the female run against each other from some distance, prancing, bowing with outspread wings, arching and stretching their necks, fluffing body feathers and calling. This duetting goes on for quite some time. This is also called the 'Unison' call of the cranes.

The male Indian Robin flaunts his white shoulder patches against the back of his body with wings dropping at the sides. He stretches his neck skyward and at the same time cocks up his tail and bends it on his back. This helps in displaying the chestnut colour around the vent. The display of the male Indian Robin, though not dazzling, is certainly an attractive sight. The male lora highlights his black, yellow and white colours by fluffing the feathers during his display. Mass display is not uncommon in different crane species. Great Pied Hornbills, huge arboreal birds of ever-green and moist deciduous forests in the Western Ghats and the Himalayas, have also been observed in a sort of a mass display.

All Kinds of Nests

Once a bird has found a mate, nest building begins. In most of the birds, the male and the female work together in nest-building. All common birds like sparrows, crows, pigeons, doves, mynas, bulbuls and many more come under this category. In some instances only the female bears the responsibility of nest-building e.g. Fairy Bluebird, Blackbellied Finch-Lark, Rosy Minivet, Common Peafowl, and Lesser Florican. And in some exceptional birds nest-building is carried out by the male e.g. Painted Snipe, Bronzewinged Jacana as well as the Button Quail and Little Bustard-Quail.

When most of us think of a bird's nest, we think of typical grass, twig and mud "cup" that many birds build. But birds nests come in a lot of different shapes and sizes including some very unusual ones. (for more about nests see All Kinds of Nests page 28).

Keeping the Eggs Warm: All birds lay eggs and most birds incubate their eggs, or keep them warm, with the heat of their own bodies.

A few birds bury their eggs in dark sand, in warm soil next to hot springs or in fermenting vegetation, all of which produce enough heat to hatch the eggs. In India there are no birds of this type. But the Megapode, a huge bird found in the Nicobar islands, lays its eggs in huge nest mounds made by scraping sand, leaves and vegetable matter. The eggs hatch by the heat of the sun and of decaying vegetable matter.

In several bird species, the male and the female take turns keeping the clutch, (group of eggs in the nest), warm. And there are a few species in which both parents sit on the clutch at the same time. But when one parent is more colourful than the other, the drabber, harder to see parent usually does most of the incubating. In polyandrous birds (where the female has more than one mate), the incubation is carried out solely by the male e.g. the Painted snipe, the Bronzewinged Jacana, Button Quail and Little Bustard-Quails. (Find out more on pages 34-35).

Hatching out:

After as few as 11 days, or as many as 90 days, depending on the species, a young bird is ready to hatch out of its egg. Using the sharp "egg-tooth" on the top of its beak the young bird slowly chips away at its eggshell, usually without any help from its parents. Several hours (or some times even several days) later, it breaks free of the egg.

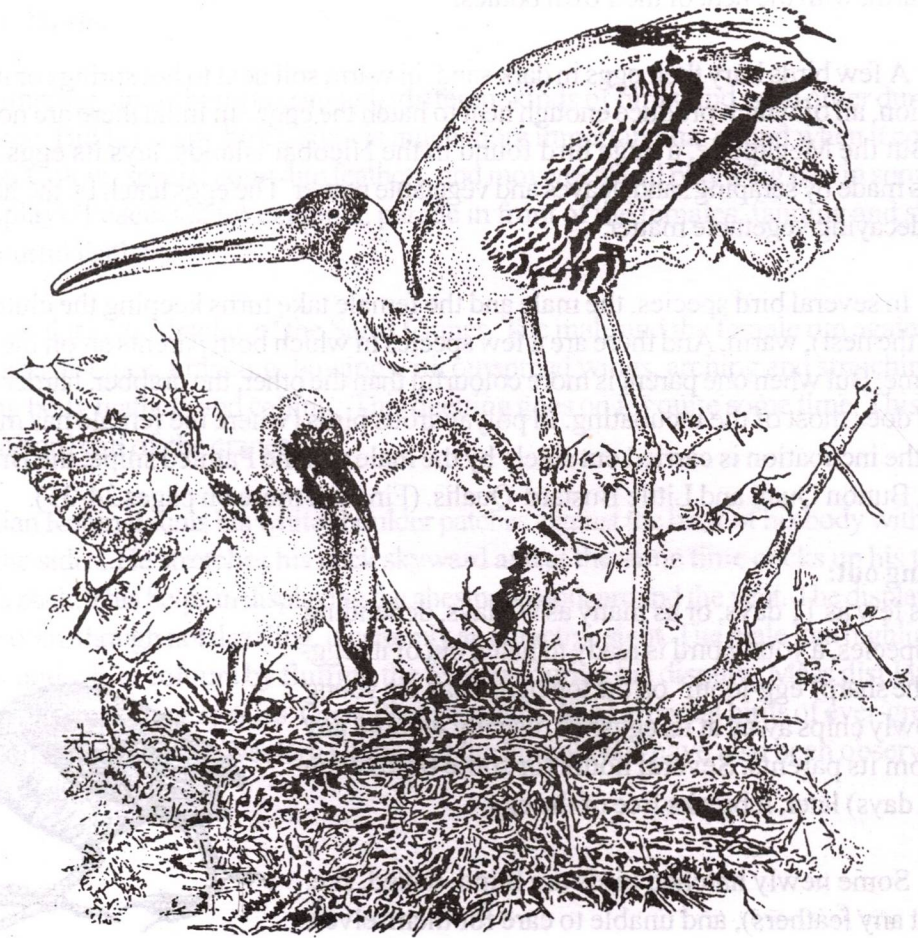
Some newly hatched birds are blind, naked, (i.e. without any feathers), and unable to care for themselves.



These helpless or altricial birds as they are called stay in the nest until they fledge, or take their first flights. they are fed by their parents, who make trip after trip to the nest, with insects and other high protein food. Even after they fledge, many altricial birds continue to be fed by their parents for a while.

Many ground nesting birds are precocial. Unlike altricial birds, precocial chicks can see well and are covered with down feathers when they hatch. In almost no time at all they can run around and even find their own food. (More on pages 34-35).

Some birds aren't completely altricial or precocial, but are some where in between e.g. Blackbellied Tem.



A Visit To Chakrata

* Swati Nagar

Far away from polluted air, raucous sounds of horns in traffic jams, hectic schedule in offices if we imagine a beautiful mountaneous range full of picturesque scenery, having a laxuriant growth of conifers is just a dream! Even its mere imagination makes us happy & relaxed. So one could easily imagine, a visit to such a place gives a realistic feeling of being in the lap of nature. Wildlife Preservation Society of India in association with Sahil Foundation had organized a Nature Track in Chakrata area on 29 & 30th June 2008.

About 35 interested people including members of Wildlife Preservation Society of India students, professionals like doctor, educationists etc. participated enthusiastically. At 8 am, we had departed from Astley Hall by bus for Chakrata. On the way, we came across beautiful lush green mountains & terrace farming on hills looks very beautiful. In the bus, we also played Quiz on environment awareness. In this way, we came to know more about environment, national parks, sanctuaries etc. We reached Kanasar forest rest house at 2 pm. It was a relishing moment for all of us as most of us were being there for the first time. There we took lunch. It was very tasty. After that, rooms were allotted to us. In the evening, after taking rest for sometime, we had tea & snacks. In the evening, we went for a walk & saw senic beauty of the area. At that time, temperature decreased few degrees & even in the month of June (being the hottest month of year) we were compelled to wear woollen clothes. After dinner at about 9 pm, we had a discussion on current issues of environment. Mr. A.S. Negi, Executive Vice President of Wildlife Preservation Society of India explained many new concepts regarding global warming like carbon trading, carbon footprinting etc. Everybody put forth their views about how can we contribute to environment ?

Next morning, after taking breakfast, we departed for Kanasar-Deoban trek at 8 am. It is a 9 km trek. We all were in 4 teams. Mr. Negi explained so many things like different types of trees, plants like cobra plant, Maiden hair (fern) etc., there were a no. of Blue Penzees (butterflies).

We have traked the steep slopes of Doedar forest. As we moved to higher altitude green tall blue pine, spruce tree were found. He also solved our queries regarding forest that were unanswered yet.

At Deoban, we reached in afternoon where we had lunch and relaxed for sometime. Again we started trekking down from Deoban to Chakrata. On the way, there were narrow path and on the other side there were steep slopes. As we saw ridges & enterants for the first time then we realize that how m̀ere twists and turns can affect the vegetation. On the way, there were lush green open land surrounded by dense conifer forest and a stream flowing along side of it. Moreover

reaching at higher altitude gives a realistic feeling of touching the horizon where clouds are floating around us. With this songs of woodpecker and Himalayan Cukoo sounds so melodious and soothing.

It was very adventurous to track down the hills of several feet high. At about 4 pm, we reached Chakrata and boarded the bus for Dehradun.

Trekking Down from hills is not a cup of tea, especially when most of us are doing it for the first time. But even then nobody loses its enthusiasm. Co-ordination and zeal to learn more about nature make the passage easy. Its being a commemorate experience to see the imprints of nature.

Next morning, after taking breakfast, we departed for Kanasur-Deoban trek at 8 am. It is a 9 km trek. We all were in 4 teams. Mr. Negi explained so many things like different types of trees, plants like copra plant, Mahoea (etc), there were a no. of Black (etc) (butterflies).

We have reached the steep slopes of Deoban forest. As we moved to higher altitude green tall blue pine, spruce tree were found. He also solved our queries regarding forest that were unanswered yet.

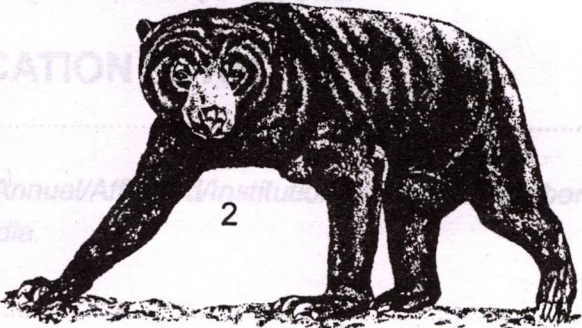
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WILDLIFE PHOTO SERIES FOR IDENTIFICATION

BEARS AND HYENA



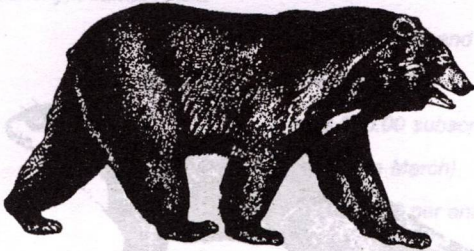
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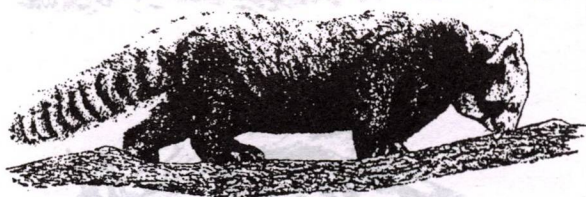


5

- 1. The Brown Bear *Ursus arctor* Local Names. Hindi *barf Ka rinch*, *lal bhalu*, *safed bhalu*, *siala rech*; Kash. *haput*; *baltistan drenbmo*; Ladak *drin mor*; Nepali *dub*; English Red Bear.
- 2. Malayan Sun Bear *Helarctos malayanus*
- 3. The Sloth Bear *Melursus ursinus* Local Names. Hindi *bhalu* (north India), *rinch* or *rech* (South India)* Mar. *asval*; Tamil & Kan. *Karadee*; Tel. *elugu bunti*; puni *karadih*. *haput*; *baltistan drenbmo*; Ladak *drin mor*; Nepali *dub*; English Red Bear.
- 4. The Striped Hyena *Hyaena hyaena* Local Name. Hindi *hunda*; *lakkar baghar* (north India.) *teras* (south India) Mar. *taras*; Tel. *dumul gundu*. *korna gundu*; Tamil *kalada koratu*, *kaluthai pult*; kan. *kathekeeruba*, *kathen kuruba*, *nal hooli*
- 5. The Himalayan Black Bear *Selenarctos thibetanus* Local Names, hindi *reech*, *rinch bhalu*; kash. *haput*; Nepali *sanar*; Bhotia *don*; Assam Hills *satun*, *sitarm*, *mapol*, *mansu bhuma*; *bur wet woon*.

WILDLIFE PHOTO SERIES FOR IDENTIFICATION

PANDA, OTTERS & MARTENS



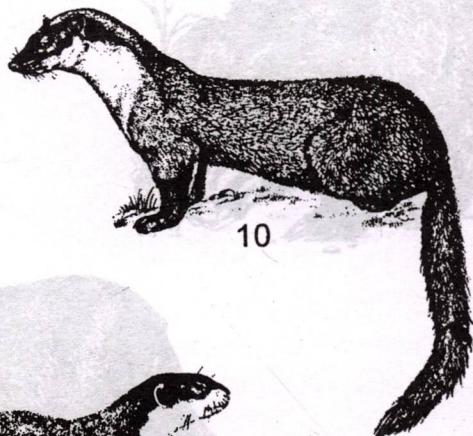
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10



11

6. The Cat-Bear, or Red Panda *Allurus fulgens* Local Names. Nepalese wah, ye, nigalva ponva; Bhotia oakdonga, wakdonga; Lepcha sankam.
7. The Clawless Otter *Aonyx Cinerea* Local Names. As for other Otters
8. The Common Otter *Lutra lutra* Local Names Hindi ud, udbilao, pani kutta; Tel niru kuka; Mal. and Tamil neer nat; Kan neeru nai, Uddra; bur. peearu
9. The Himalayan Yellowthroated Marten *Martes flavigula* Local Names. Garhwali chitrola (male, chitroli (female); Bhotia shingsam humiah; Tamil murra nai
10. The Beech, or Stone marten *Martes foina*
11. The Smooth Indian Otter *Lutra perspicillata* Local Names, Hindi ud, udni ud biloo, ludra (Sind) pani kutta jal manus (central India); Mar. pan manjar, jal manjar, kan Mal and Tamil neer nai; Tel niru kuku.



Phone : 0135-2652410

THE WILDLIFE PRESERVATION SOCIETY OF INDIA

(Established 1958)

7, Astley Hall, Dehra Dun, U.A.

APPLICATION FORM

I,
hereby
apply to be admitted as a Patron/Life/Annual/Affiliated/Institutional/Student Member of
the Wildlife Preservation Society of India.

My interests are

Name

Designation

Address

Phone No. & Email

Date of Birth

MEMBERSHIP

All Members get Cheetal (Quarterly) Journal FREE

- | | |
|------------------------------------|--|
| 1. Patrons : | Rs.25000.00 and above |
| 2. Life : | Rs.2500.00 |
| 3. Annual : | Rs.250.00 subscription per annum
(April to March) |
| 4. Students (School) | Rs.100.00 per annum |
| 5. Affiliated : | |
| (Others similar bodies) | |
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| Societies, NGOs etc.) | Rs.400.00 per year |
| 7. Institutional Life | Rs.3500.00 |

All Communications may please be addressed to the Hony. Secretary.

Signature

Signature

THE WILDLIFE PRESERVATION SOCIETY OF INDIA
(Established 1958)
PANKAJ K. MATHUR, Secretary



APPLICATION FORM

I am applying to be admitted as a Patron/Annual Member/Student Member of the Wildlife Preservation Society of India.

My interests are.....

Name.....

Designation.....

Address.....

Telephone.....

Date.....

MEMBERSHIP

All members get Cheques (Quarterly) Journal FREE

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| 6. Institutional: | (Others similar bodies) |

Patrons, Life, Annual, Students, Affiliated, Institutional, and other similar bodies, should send their application to the Secretary, Wildlife Preservation Society of India, Pankaj K. Mathur, 10, The Beach, New Delhi-110002.

Govt. Deptts., Corporations, and other similar bodies, should send their application to the Secretary, Wildlife Preservation Society of India, Pankaj K. Mathur, 10, The Beach, New Delhi-110002.

All Communications may please be addressed to the Hon. Secretary, Wildlife Preservation Society of India, Pankaj K. Mathur, 10, The Beach, New Delhi-110002.

Signature.....

The Wildlife Preservation Society of India

1. The aims and objects of the Society are as follows :-

- (a) To promote interest and impart knowledge regarding the preservation and conservation of all forms of wildlife, particularly among the youth of the country.
- (b) To cooperate with the Govt. of India and State Governments and with others Societies and Institutions having similar aims and objects in working for the interests of wildlife.
- (c) To assist in enforcing and actively supporting the Forests Acts. Wild Birds and animals Protections Acts and Rules etc. of State Governments and the Indian Arms Act and Rules in so far as they pertain to wildlife and to bring to the notice of the authorities any infringement of the same and to assist in the detention and prosecution of offenders in respect of such laws.
- (d) To advise and help the Govt. and wildlife administrators in the formation, maintenance and protection of Sanctuaries and National Parks, preservation of wildlife in general and endangered species of India in particular and in the introduction of exotic species into the country, rehabilitation of endangered species etc. and in the formulation and amendments of rules and acts, so as to conserve and increase wildlife stocks.
- (e) To raise funds for carrying out the above aims and objects and to found and maintain museums reading rooms and libraries of natural history in order to disseminate knowledge regarding wildlife.
- (f) To carry out publicity and propaganda for the preservation of wildlife in India by means of monographs, journals, films, filmstrips and other feasible methods.
- (g) To assist members of the Society in obtaining facilities for viewing and photographing wildlife in India.
- (h) To conduct research into the problem of Wildlife management in India, and in pursuance of this, to initiate, encourage and, where possible assist in the projects of the study of threatened species and related objects and to provide reference and research facilities for such work.
- (i) To carry on such other activities which will serve the above subjects.

2. What membership of Wildlife Preservation Society of India will entitle you to ?

- (1) You will become an active member of the growing group of Wildlife enthusiasts, who enjoy working for and spreading the knowledge of how to conserve India's heritage of wildlife for posterity.
- (2) You will be entitled to the full use of the library of the Wildlife Preservation Society and of its reading room.
- (3) You will receive a membership certificate.
- (4) You will receive a personal Identification and Membership Card.
- (5) You will be entitled to buy all publications of the Society at a concessional rate.
- (6) You will be entitled to buy at concessional rates the Societies Greeting Cards, Calendars. Tie, Label badges and the Balance of Nature Game (specially Published in colour for its educative and recreational values).
- (7) You will be supplied "Cheeta", the quarterly journal of the society free.

3. For membership particulars write to Honorary Secretary, Wildlife Preservation Society of India 7 Astley Hall, Dehra Dun.

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